Thinking Lean

Improving performance, customer satisfaction and the bottom line

LEADING GROWTH FIRM SERIES | REPORT 16

Ontario

"Companies in Ontario and Canada can thrive on a global basis, but only if they become much more focused on eliminating inefficiencies and driving innovation in their business, and doing so quickly."

MIDA HASENFRATZ
Chief Executive Officer
Linamar Corporation, Guelph, Ontario

Thinking Lean

IN THIS REPORT

Thinking Lean:
How Lean practices can benefit companies of any size 4

The power of Lean thinking:
How your company can profit from Lean *by Theo Peridis* 11

The skinny on Lean:
A round-table discussion reveals a diversity of experience and opinion 12

PROFILE: Empowering teams with Lean
Jake Maat, President, Virtucom Inc. 16

PROFILE: Early results in the Lean journey
Greg Walling, President, FisherCast Global Corporation 18

PROFILE: A Lean turnaround
Adam Hofmann, President, BG Furniture 20

PROFILE: Lean, Agile and globally competitive
Frédéric Boulanger, President, Macadamian Technologies Inc. 22

PROFILE: "Continuously going Lean"
David Deskur, President, CGL Manufacturing Ltd. 24

PROFILE: Lean and green
Sandeep Lal, President, Metro Label Group Inc. 26

Lean perspectives 28

Acknowledgements 29

Selected resources: Reading and references, organizations and advisory services 30

Implementing Lean principles in a company of any size and in any sector can improve performance, enhance customer satisfaction and add to the bottom line

Thinking Lean

LARGE OR SMALL, NO MATTER WHAT THEIR BUSINESS, ONTARIO COMPANIES ARE finding that applying Lean thinking pays. FisherCast Global Corporation, a mid-sized manufacturer in Peterborough, saved nearly $900,000 during its first year of Lean initiatives. At CGL Manufacturing Ltd., in Guelph, thinking Lean led to an almost 40 per cent reduction in the amount of time it takes a customer order to reach the plant floor. And Lean transformed Walkerton's BG Furniture from life support to annual revenue growth of 15 per cent.

"It doesn't matter what commodity you produce or what size you are, you will prosper from adopting Lean," says Mike Sinnaeve, Magna International Inc.'s North American vice-president for operational improvement and quality. "The principles are the same for everyone."

POWERFUL BUSINESS PHILOSOPHY

At its core, Lean manufacturing is an operational strategy oriented toward using less of everything compared with traditional mass production: less waste, human effort, manufacturing space, investment in tools, inventory and engineering time to develop a new product. Its techniques are designed to decrease the time between a customer order and shipment and radically improve profitability, customer satisfaction, throughput time and employee morale.

Lean thinking's powerful principles, first developed by Henry Ford and refined by Toyota, are catching on throughout the manufacturing world and are clearly transferable beyond the factory floor, including to the service sector. "Lean thinking offers a proven way for companies to succeed," says Dave Hogg, a consultant and Lean expert who has helped companies around the world go Lean. "There is no more powerful shaper of thinking in manufacturing, and beyond, than Lean." Hogg organized Canada's first Lean manufacturing conference in 1998 and is the chair of *From Good to Great*, which is the theme for the October 2008 international Lean conference presented by the Association for Manufacturing Excellence (AME) in Toronto (see page 31).

Companies of all types need to go from good to great in order to survive and Lean thinking will help to make that transition. With Lean extending beyond the borders of manufacturing, its principles and practices can be successfully applied to any industry or business situation. "The bottom line is you need to eliminate waste everywhere in your organization while adding value for your external and internal customers," says Hogg.

Linda Hasenfratz, CEO of Linamar Corporation, shares Hogg's belief that Lean thinking will help Ontario companies compete. "We, like so many companies, felt we were very efficient in our operations. We were wrong. Today, we look for waste every day, and every day we find it. There is always something you can do better. You are never done with Lean, and if you think you are, you don't understand the basic concept of Lean: that you must continually, every single day, look for and eliminate waste."

PLACES EMPHASIS ON THE CUSTOMER

Eliminating waste, or *muda* in the Japanese Lean lexicon that is gradually becoming part of the English language, is one of the key precepts of Lean. But muda is not simply spillage or leftovers. Muda encompasses anything that is not of value to the customer yet adds cost. It takes on many forms, from the more obvious to the less so, such as uneven workflows and inefficient processes.

In Lean thinking, it is the customer who is king or queen and he or she, not the producer, defines what waste is by what they will pay for. This emphasis on the customer driving the production process is foreign to many companies that traditionally focus on seeking new ways to supply more goods or services at a lower cost. However, without customer demand, such an approach creates muda in unused and unnecessary inventory. "For every step and process," says Hogg, "you have to ask yourself, 'Is this of value to the customer? Is this something that the customer will pay for?'"

Consider just-in-time manufacturing, now central to Lean thinking. Just-in-time production emerged as a key ingredient in Toyota's successful recipe during the 1970s. Slowly, this method of eliminating waste by reducing inventory was picked up by a handful of major manufacturers and other car manufacturers adopting just-in-time processes in the 1980s. Starting in the 1990s, its practice became widespread globally, following the publication of the laudatory history of Toyota, *The Machine That Changed the World*, written by James P. Womack, Daniel T. Jones and Daniel Roos.

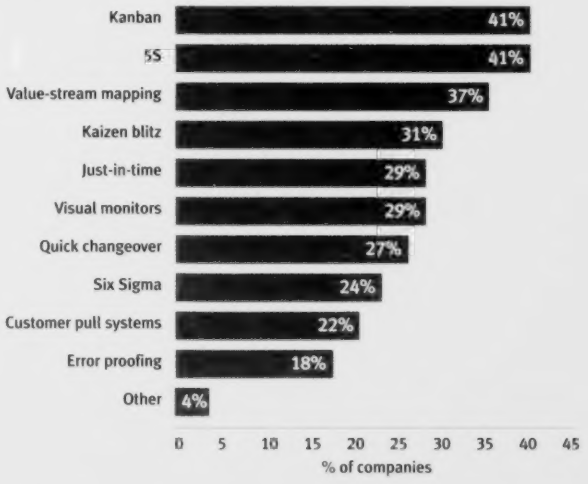
IMPLEMENTING IMPROVEMENTS BASED ON LEAN PRINCIPLES

Lean principles focus on customer needs and eliminating wasteful, non-value-adding activities. Less than half of respondents in a survey by Canadian Manufacturers & Exporters (see page 10) report that they are implementing improvements based on Lean principles.

45% **55%**

LEAN IMPROVEMENT TECHNIQUES

Companies implementing Lean improvements take advantage of a number of techniques. The most popular, employed by at least 30% of companies, are kanban, 5S, value-stream mapping and kaizen blitz.



In addition to eliminating waste and maintaining a laser focus on the customer, the third critical Lean element is continuous improvement, or *kaizen*. Continuous improvement is often referred to as the most formidable competitive weapon a company can have. It means, as Hasenfratz notes, constant vigilance among all employees to seek out any waste at any stage and improve quality to fulfill the customer's needs quickly.

LEADS TO INNOVATION

Not surprisingly, this constant emphasis on improving quality almost inevitably leads to innovation, which translates into increased competitiveness and additional value for the customer.

Achieving this employee and management mindset is perhaps the most difficult hurdle in adopting Lean. Says Hogg: "Such a cultural transformation is the biggest challenge. Usually, when culture and change collide, culture wins every time. But if the improvement is not continuous, it's not improving. Companies that claim to be Lean typically use one or two Lean tools, but they fail to adopt process thinking as opposed to the traditional focus on a particular job and/or task."

According to the 2007–2008 Management Issues Survey conducted by Canadian Manufacturers & Exporters (CME), 85 per cent of all respondents said "backsliding to old ways of doing things" was the number one obstacle to overcome in implementing improvements based on Lean principles. More troubling is that fewer than one half (45 per cent) of the respondents are implementing improvements based on Lean. Only one in 10 of those (11 per cent) is at the "advanced" stage of Lean where it has become the "standard way of operating."

Companies of all types need to go from good to great in order to survive and Lean thinking will help to make that transition. With Lean extending beyond the borders of manufacturing, its principles and practices can be successfully applied to any industry or business situation. "The bottom line is you need to eliminate waste everywhere in your organization while adding value for your external and internal customers," says Hogg.

Linda Hasenfratz, CEO of Linamar Corporation, shares Hogg's belief that Lean thinking will help Ontario companies compete. "We, like so many companies, felt we were very efficient in our operations. We were wrong. Today, we look for waste every day, and every day we find it. There is always something you can do better. You are never done with Lean, and if you think you are, you don't understand the basic concept of Lean: that you must continually, every single day, look for and eliminate waste."

PLACES EMPHASIS ON THE CUSTOMER

Eliminating waste, or *muda* in the Japanese Lean lexicon that is gradually becoming part of the English language, is one of the key precepts of Lean. But muda is not simply spillage or leftovers. Muda encompasses anything that is not of value to the customer yet adds cost. It takes on many forms, from the more obvious to the less so, such as uneven workflows and inefficient processes.

In Lean thinking, it is the customer who is king or queen and he or she, not the producer, defines what waste is by what they will pay for. This emphasis on the customer driving the production process is foreign to many companies that traditionally focus on seeking new ways to supply more goods or services at a lower cost. However, without customer demand, such an approach creates muda in unused and unnecessary inventory. "For every step and process," says Hogg, "you have to ask yourself, 'Is this of value to the customer? Is this something that the customer will pay for?'"

Consider just-in-time manufacturing, now central to Lean thinking. Just-in-time production emerged as a key ingredient in Toyota's successful recipe during the 1970s. Slowly, this method of eliminating waste by reducing inventory was picked up by a handful of major manufacturers and other car manufacturers adopting just-in-time processes in the 1980s. Starting in the 1990s, its practice became widespread globally, following the publication of the laudatory history of Toyota, *The Machine That Changed the World*, written by James P. Womack, Daniel T. Jones and Daniel Roos.

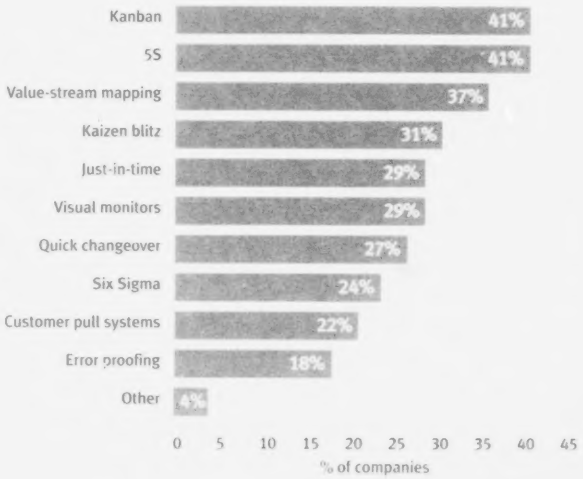
IMPLEMENTING IMPROVEMENTS BASED ON LEAN PRINCIPLES

Lean principles focus on customer needs and eliminating wasteful, non-value-adding activities. Less than half of respondents in a survey by Canadian Manufacturers & Exporters (see page 10) report that they are implementing improvements based on Lean principles.

45% 55%

LEAN IMPROVEMENT TECHNIQUES

Companies implementing Lean improvements take advantage of a number of techniques. The most popular, employed by at least 30% of companies, are kanban, 5S, value-stream mapping and kaizen blitz.



In addition to eliminating waste and maintaining a laser focus on the customer, the third critical Lean element is continuous improvement, or *kaizen*. Continuous improvement is often referred to as the most formidable competitive weapon a company can have. It means, as Hasenfratz notes, constant vigilance among all employees to seek out any waste at any stage and improve quality to fulfill the customer's needs quickly.

LEADS TO INNOVATION

Not surprisingly, this constant emphasis on improving quality almost inevitably leads to innovation, which translates into increased competitiveness and additional value for the customer.

Achieving this employee and management mindset is perhaps the most difficult hurdle in adopting Lean. Says Hogg: "Such a cultural transformation is the biggest challenge. Usually, when culture and change collide, culture wins every time. But if the improvement is not continuous, it's not improving. Companies that claim to be Lean typically use one or two Lean tools, but they fail to adopt process thinking as opposed to the traditional focus on a particular job and/or task."

According to the 2007–2008 Management Issues Survey conducted by Canadian Manufacturers & Exporters (CME), 85 per cent of all respondents said "backsliding to old ways of doing things" was the number one obstacle to overcome in implementing improvements based on Lean principles. More troubling is that fewer than one half (45 per cent) of the respondents are implementing improvements based on Lean. Only one in 10 of those (11 per cent) is at the "advanced" stage of Lean where it has become the "standard way of operating."

At one Ontario company that is implementing a formal Lean program, employees carry wallet-sized laminated cards with a series of Lean-thinking reminders. On them are listed the seven major types of waste, ranging from overproduction to simply waiting.

In an adjacent column on the card is the 5S list, comprising another Lean technique. The 5S list refers to five Japanese words beginning with the "s" sound (in English, sort, shine, set in order, standardize and sustain) that will help make your workplace better organized and more efficient. Sorting, for one, helps you discard that which is not needed, setting in order and standardizing help produce a steady workflow, while shining means keeping one's workplace clean and free of clutter. On the other side of the employee card, among other helpful Lean hints, is an exhortation to practise kaizen.

Continuous improvement can also have an impact on your supply chain, both those that supply you and those that you supply. Following the lead of Toyota, more and more Lean companies are urging their suppliers to adopt Lean thinking and methods. "Our job is to manage costs," says Ed Enns, Magna's North American director of purchasing. "If we can help one of our suppliers take out waste, we will." Specifically, Magna might perform a value analysis of the supplier's product, leading to a redesign and/or the use of more economical materials. Or it might look at making the supplier's manufacturing process more efficient. Says Enns: "It's in our interest to ensure that our strategic suppliers sustain their business viability to cement our long-term relationship. Lean thinking can help, and we both benefit."

An example can be found in one area of a Newmarket, Ontario, Magna plant that assembles chrome handles and a related component, both supplied by an outside company. The two items are each shipped to Magna in protective plastic packages. Before assembly, the plastic must be torn off to retrieve the piece. Then the plastic has to be put into a separate waste container. The ripping and disposing of thousands of pieces of plastic wastes time and is environmentally unfriendly. Concerned about the process, the workers approached their supervisor who rallied the team to call the supplier and seek changes that will produce a win-win. Eliminating the plastic will lower the items' costs, make the operators more efficient and benefit the environment. "These people are thinking Lean," enthuses Sinnaeve.

GLOBAL COMPETITORS EMBRACE LEAN

Canadian companies should do more of such thinking, says Hogg. "Most businesses tend to do what is necessary to survive today, but will they survive tomorrow?" he asks. "For India and China, which are just developing their manufacturing industries, Lean is the only way of doing things. They have no historical operational patterns that need to be replaced and are buying some of the world's best technology to dramatically accelerate the Lean they welcome."

Womack, the widely respected guru of Lean, puts the challenge even more bluntly: "There are 1.3 billion people in China, they all want your job and they're willing to work for less money." And, he might add, there are more than 1.1 billion people in India.

As Ontario companies are learning, engaging their employees is the key component of continuous improvement and the road to success. "Continuous improvement, or kaizen, is critical," says Adam Hofmann, president of BG Furniture. "It's about culture change, rather than a suggestion box." (See page 20.)

Employees know best how the processes work, where the problems lie, where there is waste. CGL Manufacturing's Lean initiatives have propelled revenue growth of more than 50 per cent over the past three years. CGL president David Deskur credits that

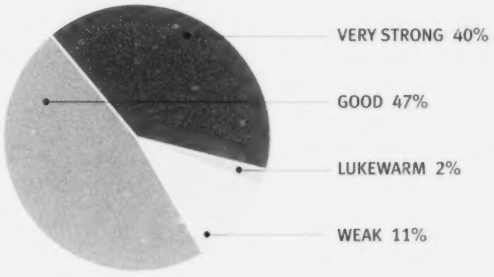
THE BENEFITS OF GOING LEAN

Companies implementing Lean improvements were asked to identify the top five benefits for their business. The majority of firms report improvements in operating efficiencies, reduction in plant space, waste reduction, accelerated inventory turnover and faster lead times. One-third of companies implementing Lean practices report that they are seeing improvements in the form of increased cash flow and improved profit margins.

	% of companies
Improved process efficiency	82%
Reduction in plant space	64%
Waste reduction	61%
Inventory turnover	61%
Faster production lead times	52%
On-time delivery	48%
Reduction in warehouse space	48%
Improved product quality	45%
Improved customer service	45%
Better materials management	42%
Lower cost of materials	42%
Employee satisfaction	39%
Improved purchasing management	36%
Improved health and safety record	33%
Supply chain efficiency	33%
Increase in cash flow	30%
Increase in operating profits	27%
Better order fulfilment	24%
Benefits to suppliers and distributors	22%
Fewer defects	21%
Improved environmental performance	21%
Increase in market share	18%

LEVEL OF SUPPORT FOR LEAN IMPLEMENTATION

A majority of companies on their Lean journey report good or strong support by senior management for their continuous improvement efforts.



success to employee involvement. His advice: "Ask your people what's going on, rather than talk about it in the boardroom." (See page 24.)

Hogg agrees: "It's a people process. Success is not possible nor sustainable unless your people are actively involved from the beginning." Positive signs become apparent soon after you embark on the Lean journey. "The best time to go for Lean is when times are good, so they will stay good. If you do it right, you can start seeing results right away, which should pay for the next steps," he adds. However, even if you are starting late, it is vitally important to set objectives for the areas where success is assured and results can be seen quickly. The first month is critical because it sets the tone for the rest of the Lean program implementation, as companies that have been pulled back from the brink or have substantially improved their financial well-being will attest.

POSITIVE RESULTS ARE MEASURABLE

Womack has studied Lean implementation around the world for decades and has come up with truly dramatic findings. "Converting a classic batch-and-queue production system to continuous flow with effective pull by the customer will double labour productivity . . . while cutting production throughput times by 90 per cent and reducing inventories by 90 per cent," he writes.

That's only the beginning. In terms of quality control, errors reaching the customer are usually cut in half, as are job-related injuries. Says Womack: "Time-to-market for new products will be halved and a wider variety of products, within product families, can be offered at very modest additional cost. What's more, the capital investments required will be very modest, even negative, if facilities and equipment can be freed up." And, he adds, if continuous improvement becomes part of the culture, productivity typically doubles again within two to three years, with inventories, errors and lead times being reduced by another half. Or, as Sandeep Lal, president of Metro Label Group Inc., a multiple winner of both environmental and business awards, puts it: "The best award for Lean is being profitable." (See page 26.)

FisherCast Global Corporation, a manufacturer of innovative die-cast components and solutions, achieved much of its first-year savings by rearranging workflows and processes as it consolidated two operations into one. Cellular models replaced assembly-line batch-and-flow processes. "We could never have made the move without input from people on the shop floor on removing waste from our processes," says Brian Baker, FisherCast's director of strategic planning. (See page 18.) Adds company president Greg Walling: "Now if we are having quality problems or customer service issues, we bring in our Lean experts as a kind of SWOT [strengths, weaknesses, opportunities and threats] team."

BOOSTS EMPLOYEE PRODUCTIVITY

Ottawa-area Virtucom Inc. started introducing Lean principles in late 2005. (See page 16.) The manufacturer of sheet-metal components rearranged its workflows to make skilled employees more flexible. For example, instead of welding the same product all day, regardless of actual demand, a welder now produces what is needed, when it is needed, and performs some other useful function the rest of the time. This way, "Lean boosts employee productivity without making people work harder," says Virtucom president Jake Maat. "The customer receives what he or she needs and gets it quicker."

OBSTACLES TO EFFECTIVE LEAN IMPLEMENTATION

The most important obstacles to overcome in implementing improvements based on Lean principles are backsliding to old ways of doing things, a lack of implementation know-how and resistance to change.

	% of companies
Backsliding to old ways of doing things	85%
Lack of implementation know-how	61%
Failure to remove "ankle-draggers" who resist change	42%
Middle management resistance	39%
Lean viewed as "flavour of the month"	36%
Supervisor resistance	36%
Accounting practices that don't recognize value of shop floor improvements	33%
Employee resistance	30%
Lack of support from senior management	30%
Complexity of operating environment	21%
Failure of past Lean projects	18%
Lack of support from suppliers	15%
Insufficient returns	12%
Lack of support from customers	6%

A glossary of Lean terms

ACTIVITY-BASED COSTING (ABC)
An accounting practice that allows an organization to determine the actual cost of a product or service by tracking the cost back to the specific activities that produce or provide it.

CORE PROCESSES
The essential activities an organization must perform to produce products, complete order fulfilment, maintain assets and complete all supporting business functions.

DEFECT
A part, product or service that does not conform to specifications or a customer's expectations. Defects are caused by errors.

DEMAND-SUPPLY CHAIN
All the parts, materials and services that are supplied by outside sources in order to produce a product or service.

ENTERPRISE RESOURCE PLANNING (ERP)
The integration of an organization's departments and functions onto a single computer system that can serve all those different departments' needs.

ERROR
Any deviation from a specified manufacturing or business process. Errors cause defects in products or services.

ERROR-PROOFING DEVICES
Mechanical, electrical or pneumatic devices that signal existing errors or prevent potential ones.

THE 5S APPROACH (SORT, SHINE, SET IN ORDER, STANDARDIZE AND SUSTAIN)
A workplace discipline, usually attributed to the Toyota Production System (TPS), of creating a clean and orderly workplace that exposes waste and errors.

FIXED-VALUE METHOD
An error-proofing method that ensures the right quantity of parts is used or the right number of activities is performed.

JUST-IN-TIME (JIT) INVENTORY
A method of inventory management in which stock is delivered just as it is needed. JIT minimizes inventory levels.

KAIZEN
A Japanese management concept of continuous improvement that strives for perfection by continually eliminating successive layers of waste. It requires the involvement of all employees.

KANBAN
A just-in-time production method that employs standardized containers or lot sizes with a signal card attached to each. The card indicates that a work centre wishes to pull, or withdraw, parts from feeding operations or suppliers.

LEAN METRICS
Financial, behavioural and core-process measurements that help an organization monitor its progress toward achieving the goals of its Lean initiative.

MUDA (WASTE)
Any activity that uses resources but creates no value for the customer. The "7 Deadly Wastes": waste from over-production; waste of waiting time; transportation waste; processing waste; inventory waste; waste of motion; and waste from product defects.

PRODUCTION SMOOTHING
Synchronizing production of a company's different products to match customer demand.

PULL-BASED MANUFACTURING
A system in which no goods or services are produced until the customer downstream asks for them. The customer can be internal or external.

ROOT CAUSE ANALYSIS
A process of identifying problems within an organization, finding their causes and creating the best methods to prevent them from recurring.

SIX SIGMA
A management strategy, originated by Motorola, that seeks to improve quality by virtually eliminating defects from existing processes, products and services.

SUPPLY CHAIN MANAGEMENT
A strategy to improve shareholder and customer value by optimizing the flow of products, services and related information from source to customer. It requires a trading-partner community engaged in a common goal of satisfying the end customer.

VALUE-ADDED ACTIVITIES
Tasks performed during the production of a product or service that increase its value to the customer.

VALUE STREAM
All the activities that a company must perform to design, order, produce and deliver its products or services to customers.

VALUE-STREAM MAP
A planning tool that uses simple graphics or icons to show the sequence and movement of information, materials and actions in a company's value stream.

WORKFLOW
The steps and motions employees take to perform their work tasks.

WORKFLOW DIAGRAM
A graphic that shows an organization's current equipment and the movement of employees during work processes.

WORK SEQUENCE
The order in which tasks that make up work processes are performed.

Sources: Lean Enterprise Institute; *The Lean Enterprise Memory Jogger™: Create Value and Eliminate Waste throughout Your Company*, Richard L. MacInnes, 2002; and QAD Inc.'s *Lean Manufacturing Resource Guide*

One typical Magna unit used to have 10 operators arranged in a straight line. Work would be handed off from one person to another, up to 15 steps away. If a delay occurred at any one point on the line, everyone would be idle when work would stop. Now, working in a U-shaped unit, operators perform each of the five or six functions required to complete a task, moving steadily from station to adjacent station. In Lean terminology, this cellular approach is called "continuous flow." The focus is on meeting customer demand with minimal or no inventory. What used to take 10 people now needs only five. However, should increased demand require more production, the new workstation design can accommodate up to 10 people. Such built-in flexibility allows Magna to respond to a range of customer requirements. Magna is so committed to Lean that it flies a former Toyota executive from

A glossary of Lean terms

ACTIVITY-BASED COSTING (ABC)
An accounting practice that allows an organization to determine the actual cost of a product or service by tracking the cost back to the specific activities that produce or provide it.

CORE PROCESSES
The essential activities an organization must perform to produce products, complete order fulfilment, maintain assets and complete all supporting business functions.

DEFECT
A part, product or service that does not conform to specifications or a customer's expectations. Defects are caused by errors.

DEMAND-SUPPLY CHAIN
All the parts, materials and services that are supplied by outside sources in order to produce a product or service.

ENTERPRISE RESOURCE PLANNING (ERP)
The integration of an organization's departments and functions onto a single computer system that can serve all those different departments' needs.

ERROR
Any deviation from a specified manufacturing or business process. Errors cause defects in products or services.

ERROR-PROOFING DEVICES
Mechanical, electrical or pneumatic devices that signal existing errors or prevent potential ones.

THE 5S APPROACH (SORT, SHINE, SET IN ORDER, STANDARDIZE AND SUSTAIN)
A workplace discipline, usually attributed to the Toyota Production System (TPS), of creating a clean and orderly workplace that exposes waste and errors.

FIXED-VALUE METHOD
An error-proofing method that ensures the right quantity of parts is used or the right number of activities is performed.

JUST-IN-TIME (JIT) INVENTORY
A method of inventory management in which stock is delivered just as it is needed. JIT minimizes inventory levels.

KAIZEN
A Japanese management concept of continuous improvement that strives for perfection by continually eliminating successive layers of waste. It requires the involvement of all employees.

KANBAN
A just-in-time production method that employs standardized containers or lot sizes with a signal card attached to each. The card indicates that a work centre wishes to pull, or withdraw, parts from feeding operations or suppliers.

LEAN METRICS
Financial, behavioural and core-process measurements that help an organization monitor its progress toward achieving the goals of its Lean initiative.

MUDA (WASTE)
Any activity that uses resources but creates no value for the customer. The "7 Deadly Wastes": waste from over-production; waste of waiting time; transportation waste; processing waste; inventory waste; waste of motion; and waste from product defects.

PRODUCTION SMOOTHING
Synchronizing production of a company's different products to match customer demand.

PULL-BASED MANUFACTURING
A system in which no goods or services are produced until the customer downstream asks for them. The customer can be internal or external.

ROOT CAUSE ANALYSIS
A process of identifying problems within an organization, finding their causes and creating the best methods to prevent them from recurring.

SIX SIGMA
A management strategy, originated by Motorola, that seeks to improve quality by virtually eliminating defects from existing processes, products and services.

SUPPLY CHAIN MANAGEMENT
A strategy to improve shareholder and customer value by optimizing the flow of products, services and related information from source to customer. It requires a trading-partner community engaged in a common goal of satisfying the end customer.

VALUE-ADDED ACTIVITIES
Tasks performed during the production of a product or service that increase its value to the customer.

VALUE STREAM
All the activities that a company must perform to design, order, produce and deliver its products or services to customers.

VALUE-STREAM MAP
A planning tool that uses simple graphics or icons to show the sequence and movement of information, materials and actions in a company's value stream.

WORKFLOW
The steps and motions employees take to perform their work tasks.

WORKFLOW DIAGRAM
A graphic that shows an organization's current equipment and the movement of employees during work processes.

WORK SEQUENCE
The order in which tasks that make up work processes are performed.

Sources: Lean Enterprise Institute; *The Lean Enterprise Memory Jogger™: Create Value and Eliminate Waste throughout Your Company*, Richard L. MacInnes, 2002; and QAD Inc.'s *Lean Manufacturing Resource Guide*

One typical Magna unit used to have 10 operators arranged in a straight line. Work would be handed off from one person to another, up to 15 steps away. If a delay occurred at any one point on the line, everyone would be idle when work would stop. Now, working in a U-shaped unit, operators perform each of the five or six functions required to complete a task, moving steadily from station to adjacent station. In Lean terminology, this cellular approach is called "continuous flow." The focus is on meeting customer demand with minimal or no inventory. What used to take 10 people now needs only five. However, should increased demand require more production, the new workstation design can accommodate up to 10 people. Such built-in flexibility allows Magna to respond to a range of customer requirements. Magna is so committed to Lean that it flies a former Toyota executive from

Japan to visit its North American operations once every three months to ensure there is continuous improvement.

Another significant benefit of Lean is a positive impact on the environment. Businesses such as Toronto-based Metro Label show how going green complements Lean measures to reduce waste. As companies become more efficient, they use less energy in their processes and require less plant, warehouse or office space that needs to be heated or lit. More efficient flow on the plant floor means less fuel to transport items from place to place.

ADAPTABLE TO SERVICE AND TECHNOLOGY SECTORS

With the promise of increased revenues, reduced waste and enhanced customer satisfaction, going Lean would appear to be a no brainer, but the challenge of turning around a corporate culture can be daunting. Some of Lean's applications, such as questioning the value of increased production, seem counterintuitive at first since most people equate increased production with greater productivity. However, Lean practices and just-in-time delivery have been responsible for enormous improvements in productivity and quality over the past three decades and are used successfully by industries that range from manufacturing and logistics to product development.

On the service side, a new way of thinking is also required. Traditionally, a customer-service operation or call centre might strive to answer more complaints per hour or to solve a larger percentage of problems. With Lean thinking, the emphasis would instead be on fixing the root causes so that the problems don't arise. "Though the service sector has been slow to adopt Lean, the principles of identifying value to the customer, simplifying flow to minimize waste and pulling demand for greater profitability apply to all types of business environments," says Betsi Harris Ehrlich, author of *Transactional Six Sigma and Lean Servicing* and an industrial engineer.

LEAN AND AGILE SOFTWARE DEVELOPMENT

Another emerging field is Agile, which is very specific to software development projects and environments and encourages higher productivity and increased accountability to customers. Basically, the Agile philosophy uses intense customer interaction to identify features, imposes rigorous disciplines for quality control and relies on skilled professionals to perform key jobs efficiently. The world of Agile places a high value on people. Agile was not conceived from the top by executives trying to make software projects more accountable; it started at the bottom with developers self-regulating the uncontrollable quality situation in the software industry by embracing tried-and-true patterns of success. As a self-imposed discipline and quality standard, the main objective of Agile is "working software."

Ottawa software outsourcer Macadamian Technologies Inc. (see page 22) adheres to the widely accepted 12-principle Agile Manifesto, which includes this adage: "Continuous attention to technical excellence and good design enhances agility." Explains Sylvain St-Germain, the company's director of process improvement, "When we create software, every developer's work is reviewed for errors. This helps ensure we get rid of the bad code — waste — early in the process, before bugs get entrenched in the system."

Introducing Lean thinking involves upfront costs, from training employees to shutting down equipment and processes to properly assess their contribution to customer value. However, the savings should more than compensate for the initial costs and they should continue to grow.

CEOs may feel they are too busy to devote the necessary leadership to introducing Lean, but Hogg says that would be a mistake: "To start the process, you need a vision of where you want to be. Lean is a tool to help you get there. It's not the end in itself." One path to Lean is travelling with like-minded companies. Many small and medium-sized companies find adoption goes faster if they join a Lean consortium of non-competing firms that learn from each other.

The Lean journey starts as a top-down approach and requires

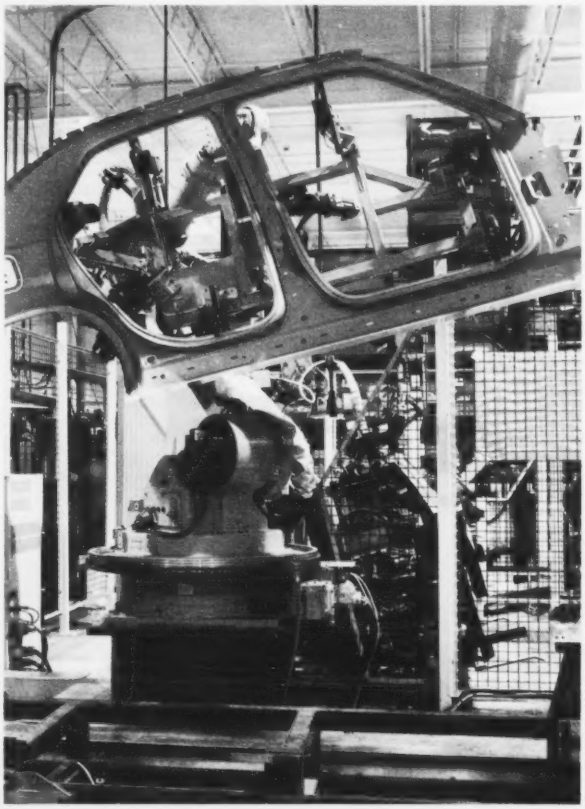
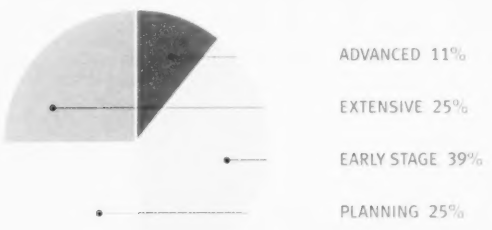


Photo courtesy of Magna International Inc.

At Magna International, above, employees are encouraged to look for ways to eliminate waste and improve processes. The company is so committed to Lean that it retains a former Toyota executive on a part-time basis to help keep tabs on its continuous improvement program. Magna also encourages companies in its supply chain to adopt Lean principles.

STAGE OF LEAN IMPLEMENTATION

Among those companies implementing Lean improvements, 11% report that they are at the advanced implementation stage where Lean has become the standard way of operating. Another 25% say that extensive implementation of Lean concepts is under way in many areas of the business and solid progress is being made. Other companies are at the early implementation stage, taking first steps to implement Lean improvements.



vision, total commitment from senior management and support from employees to succeed. There has to be leadership from the top. "Anything sustainable has to have CEO commitment and involvement," Hogg says. "He or she must provide the vision and be actively and visibly involved." Securing Lean leadership and a champion (or champions), both at the outset and throughout the process, is key. The CEO must be prepared to lead the charge, ensure sustainability and set the tone for the cultural change required to embrace continuous improvement.

EMPOWERING EMPLOYEES

As part of the culture, workers at a Lean-thinking company are empowered to identify and fix problems on their own. At Toyota plants, any employee who spots a problem can pull a yellow cord and bring production to a halt. Clearly, that takes a level of confidence that is rare in most workplaces.

"As CEO, I need to build an atmosphere of trust so that all information, not just good news, flows readily," says Frederic Boulanger, president of Macadamian Technologies. "You can't shoot the messenger."

For his part, Simaeve's motto for Magna is "Do it, fix it and learn from it." He wants employees to feel that "it's okay to fail today for success tomorrow. Mistakes can be the best education. Don't be afraid for things to get worse before they get better."

Ehrlich writes: "One of Lean's key tenets, often forgotten or downplayed, is the relationship between salaried management and employees. There can be no Lean if there is an antagonistic relationship between management and employees."

Executives may also have to modify their behaviours. "Senior leaders are most at home as either strategic thinkers or financial thinkers," write Womack and co-author Jones in their latest book, *Lean Solutions: How Companies and Customers Can Create Value and Wealth Together*. "In either case, they find it easiest to look at the problem from the standpoint of their own organization . . . What's missing is a 'chief process officer' — someone at the top who can employ process thinking to take responsibility for the definition and continuous improvement of the key value-creating processes. This means working backward from the customer's complete specification of value, and it often involves rethinking the efforts of many firms."

To many, Lean seems rather mysterious, but those who adopt its principles find that it is very much the opposite. "It's not steeped in black magic," says Hogg. "It's pretty logical stuff."

Long before Ford and Toyota, Benjamin Franklin wrote, "Haste makes waste," making him perhaps the earliest Lean proponent. Today, Womack's Lean definition is wordier, but just as rooted in common sense: "Lean thinking is lean because it provides a way to do more and more with less and less — less human effort, less equipment, less time and less space — while coming closer and closer to providing customers with exactly what they want."

VIEW FROM THE TOP FOR FUTURE MARKETS

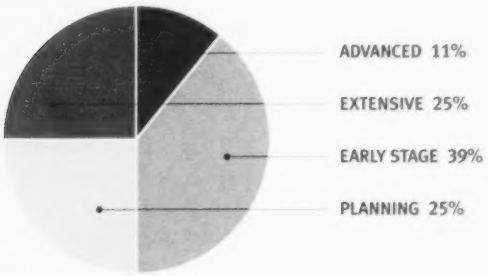
There are few issues more important for Ontario small- and medium-sized enterprises (SMEs) today than competing and growing in global markets. According to Canadian Manufacturers & Exporters (CME), as reported in its *View from the Top for Future Markets: 2007–2008 Management Issues Survey*, "Continuous improvement based on Lean principles and techniques is an important way of generating customer value, eliminating waste and systematically improving cash flow. Lean practices are vital, given the bottom-line pressures manufacturers face on a daily basis. But while many companies may be working on Lean incentives, only 11 per cent say that Lean principles have become a standard operating practice. Companies still face significant constraints in achieving measurable performance improvements. It is a challenge more will have to meet if they are to compete and win in global markets."

The charts in this report are from CME's 2007–2008 Management Issues Survey. A total of 1,014 companies responded, reflecting business operations located in all provinces across Canada. Fifty-two per cent have operations in Ontario. The survey covers companies of all sizes, with a large majority — 89 per cent — being SMEs. Forty-seven per cent have sales of less than $10 million, while 67 per cent employ fewer than 100 people and 24 per cent employ between 10 and 500 people on a full-time basis. In contrast, 7 per cent have sales of $500 million or more, while 11 per cent have 500 or more full-time employees. Manufacturers represent 89 per cent of all respondents; 41 per cent report they are also in another line of business; 48 per cent say they only manufacture; and 85 per cent are exporters. Twenty-five per cent say that 25 per cent or more of their revenues come from products introduced in the last three years.

CHARTS: Canadian Manufacturers & Exporters 2007–2008 Management Issues Survey. They have been reproduced with permission.

STAGE OF LEAN IMPLEMENTATION

Among those companies implementing Lean improvements, 11% report that they are at the advanced implementation stage where Lean has become the standard way of operating. Another 25% say that extensive implementation of Lean concepts is under way in many areas of the business and solid progress is being made. Other companies are at the early implementation stage, taking first steps to implement Lean improvements.



vision, total commitment from senior management and support from employees to succeed. There has to be leadership from the top. "Anything sustainable has to have CEO commitment and involvement," Hogg says. "He or she must provide the vision and be actively and visibly involved." Securing Lean leadership and a champion (or champions), both at the outset and throughout the process, is key. The CEO must be prepared to lead the charge, ensure sustainability and set the tone for the cultural change required to embrace continuous improvement.

EMPOWERING EMPLOYEES

As part of the culture, workers at a Lean-thinking company are empowered to identify and fix problems on their own. At Toyota plants, any employee who spots a problem can pull a yellow cord and bring production to a halt. Clearly, that takes a level of confidence that is rare in most workplaces.

"As CEO, I need to build an atmosphere of trust so that all information, not just good news, flows readily," says Frédéric Boulanger, president of Macadamian Technologies. "You can't shoot the messenger."

For his part, Sinnaeve's motto for Magna is "Do it, fix it and learn from it." He wants employees to feel that "it's okay to fail today for success tomorrow. Mistakes can be the best education. Don't be afraid for things to get worse before they get better."

Ehrlich writes: "One of Lean's key tenets, often forgotten or downplayed, is the relationship between salaried management and employees. There can be no Lean if there is an antagonistic relationship between management and employees."

Executives may also have to modify their behaviours. "Senior leaders are most at home as either strategic thinkers or financial thinkers," write Womack and co-author Jones in their latest book, *Lean Solutions: How Companies and Customers Can Create Value and Wealth Together*. "In either case, they find it easiest to look at the problem from the standpoint of their own organization . . . What's missing is a 'chief process officer' — someone at the top who can employ process thinking to take responsibility for the definition and continuous improvement of the key value-creating processes. This means working backward from the customer's complete specification of value, and it often involves rethinking the efforts of many firms."

To many, Lean seems rather mysterious, but those who adopt its principles find that it is very much the opposite. "It's not steeped in black magic," says Hogg. "It's pretty logical stuff."

Long before Ford and Toyota, Benjamin Franklin wrote, "Haste makes waste," making him perhaps the earliest Lean proponent. Today, Womack's Lean definition is wordier, but just as rooted in common sense: "Lean thinking is lean because it provides a way to do more and more with less and less — less human effort, less equipment, less time and less space — while coming closer and closer to providing customers with exactly what they want."

VIEW FROM THE TOP FOR FUTURE MARKETS

There are few issues more important for Ontario small- and medium-sized enterprises (SMEs) today than competing and growing in global markets. According to Canadian Manufacturers & Exporters (CME), as reported in its *View from the Top for Future Markets: 2007–2008 Management Issues Survey*, "Continuous improvement based on Lean principles and techniques is an important way of generating customer value, eliminating waste and systematically improving cash flow. Lean practices are vital, given the bottom-line pressures manufacturers face on a daily basis. But while many companies may be working on Lean incentives, only 11 per cent say that Lean principles have become a standard operating practice. Companies still face significant constraints in achieving measurable performance improvements. It is a challenge more will have to meet if they are to compete and win in global markets."

The charts in this report are from CME's 2007–2008 Management Issues Survey. A total of 1,014 companies responded, reflecting business operations located in all provinces across Canada. Fifty-two per cent have operations in Ontario. The survey covers companies of all sizes, with a large majority — 89 per cent — being SMEs. Forty-seven per cent have sales of less than $10 million, while 67 per cent employ fewer than 100 people and 24 per cent employ between 10 and 500 people on a full-time basis. In contrast, 7 per cent have sales of $500 million or more, while 11 per cent have 500 or more full-time employees. Manufacturers represent 89 per cent of all respondents; 41 per cent report they are also in another line of business; 48 per cent say they only manufacture; and 85 per cent are exporters. Twenty-five per cent say that 25 per cent or more of their revenues come from products introduced in the last three years.

CHARTS: Canadian Manufacturers & Exporters 2007–2008 Management Issues Survey. They have been reproduced with permission.

The power of Lean thinking

Theo Peridis, professor of Strategic Management and International Business at York University's Schulich School of Business, says any company that includes all aspects of its operations in its Lean vision can reap great benefits from its implementation

BY THEO PERIDIS

CEOS WHO ARE CONSIDERING ADOPTING Lean practices first need to understand what Lean is — and what it is not — and how Lean can help — and how it cannot. For most people, Lean means taking the waste out of their manufacturing and assembly processes. While that is an essential element of a Lean strategy, Lean is much more than that. It is also a powerful philosophy and approach to doing business.

Lean implies Lean thinking, a way of conducting your business so that every day you and all your employees are attempting to identify waste and take it off the floor and out of your offices. From that comes the Lean concept of continuous improvement.

The manufacturing floor is the easiest place to look for waste, but it is not the only place. Rooting out waste extends from how you order and use raw materials to how decisions are made in the executive suite. If you are able to expand your vision to include all aspects of your operation, you can reap great benefits from implementing Lean.

Removing waste is a common-sense mantra, but most of us don't realize how much waste there is around us. At home, even though we are getting better at recycling, we still toss out a piece of paper once we write on just one side. In business, there is waste every moment a machine is idle. Can this machine be used in another way? Is that machine really necessary or is there another one that can perform multiple functions so that it is always busy?

IDLE INVENTORY EQUALS WASTE Inventory can also be wasteful. Only good wine improves with age. Inventory that sits unused, not providing immediate value to the customer, becomes dated and obsolete. Another common waste area is

decision making. How much time do you spend reaching a decision? How many people are involved and why? Every time a piece of paper is pushed to the next person, it consumes time and energy and increases the chances of error.

Some companies are good at analyzing their processes and identifying waste. Unless this is an ongoing process, though, the savings tend to become a one-shot deal. Soon you find it is back to business as usual or the environment changes and different cost-saving measures are required. Unless you are committed to continuous improvement, the benefits of waste reduction are easily lost.

Lean companies achieve shorter delivery times, better products and lower costs, all of which lead to improved customer satisfaction. This, in turn, leads to growth and greater profits. These benefits also improve employee morale, which makes it all the more likely staff will buy into continuous improvement.

By far the biggest obstacle to a Lean transformation is cynicism from employees who view it as the "fad of the month." Senior management needs to walk the talk. Employees must be empowered and rewarded for participating in the improvement effort. After a while, the message will sink in.

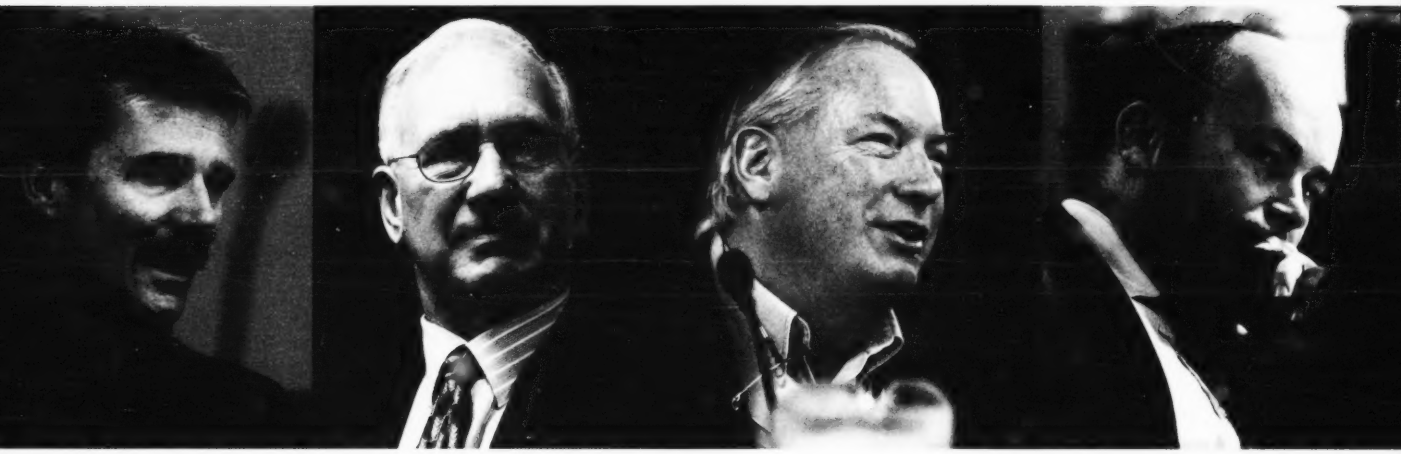
ERRORS ARE OPPORTUNITIES In a Lean environment, there are no errors or mistakes. The word "failure" does not exist. Everything is a learning opportunity. Errors are transformed into opportunities for improvement. When there is a customer complaint, a Lean business will do more than fix the problem; it will try to fix the system that created the problem. All the wasted time and energy involved in redoing work and dealing with customer complaints can be drastically curtailed. In a Lean enterprise, a customer complaint is not a problem to be fixed; it is a source of inspiration to make the organization more efficient.

Ontario's current economic climate means adopting Lean makes more sense than ever. During the 1990s, manufacturers got a free ride from our lower dollar. While the United States and Europe underwent painful adjustments in response to foreign competition, our dollar hid Canadian inefficiencies. Canada can no longer hide, however, because Canadian companies are facing powerful competition from everywhere. China can make anything cheaply and the quality of its products is improving rapidly. India has so many engineers it already surpasses Canada in new products, new designs and new processes.

If your profits are down for a month or a quarter, Lean won't provide a quick fix. Lean is not a panacea, but its culture will put your business on the right path and yield very rewarding long-term results.

The skinny on Lean

A CEO round-table discussion about the benefits and pitfalls of Lean reveals a diversity of experience and opinion



In January 2008, the Ontario Ministry of Small Business and Entrepreneurship hosted a round-table discussion on Lean for CEOs and presidents of eight successful small- and medium-sized enterprises (SMEs) based in southwestern Ontario. Their firms — in the manufacturing, service and/or technology sectors — range in size from 37 to 170 employees and have annual sales of between $8.3 million and $30 million. The participants are at various stages of Lean, from exploring its potential or making solid progress with formal programs in place to being in the advanced implementation phase. Others are taking advantage of a few Lean techniques but have no formal programs as yet. Those exploring the benefits of Lean express reservations about its value overall; those practising Lean voice a great deal of enthusiasm for it. Here are highlights of the three-hour discussion.

MODERATOR: One of the things that we are going to be focusing on is leadership and how you see your role in the Lean process.

PAUL HOGENDOORN **(President, OES, Inc., London, Ontario. OES produces a wide range of electronic control products, including sports scoreboards and timing systems):** I am somewhat skeptical about Lean. There are some really good areas to do Lean and then there are some where I don't think there is a book written on how to do it. Lean is a really good system to help you achieve your goals, but is Lean the goal in and of itself? Everyone is focused on Lean in the manufacturing shop, but we have been focusing on the front office. Lean is reducing waste: wasted time, wasted energy, wasted material. Probably the biggest source of waste that costs the most is mistakes. If you make a mistake in the front end — for example, when putting together the quote — you are likely going to add to the cost of that mistake all the way through the process to the shop. The earlier you catch the mistake, the less waste you will have.

C. J. DAVID NETTLETON **(President, Sertapak Group Packaging Systems, Woodstock, Ontario. Sertapak designs and manufactures custom packaging systems, primarily for the automotive industry but not exclusively for it):** Lean isn't really a tool or a program. It is a philosophy about how you run your business, not just your shop floor. It is very much about changing the way you do everything. It is a cultural shift. Toyota is our biggest customer. If you want to see the epitome of Lean, look at the Toyota production system. You can't do business with Toyota and not be infected by the process. We don't have any option but to become Leaner. According to Toyota, you will never get there. It is continuous improvement. We work at it every day. I couldn't agree more that it starts at the front end.

PETER ALLEN **(President, Electrical Contacts Ltd., Hanover, Ontario. Electrical Contacts manufactures electrical components for large corporations such as Siemens and General Electric):** We have been doing Lean for about eight months as a formal program. Lean really does mean a profound culture change. It has challenged me personally as CEO. Sometimes you have to admit that the processes and the procedures that you built and held people accountable for aren't appropriate any more. Maybe the waste that you have identified through a value-stream map, which is a Lean technique, tells you that the process that was your baby is actually fat and dumb.

Left to right: Paul Hogendoorn, Keith Stevens, Dave Nettleton, Peter Allen, Jim McCabe, Harvey Schilke, Brad Hillis and Doug White

MODERATOR: My question is for Dave [Nettleton], who said that he has no choice but to become Leaner. I am wondering this: if you have no choice, what are the roadblocks?

NETTLETON: It is very much about changing the way we do everything in the business. Of course, some areas have higher priorities and some are more difficult to implement. We have been in business 25 years. I think we have a reasonable mission statement. Like all mission statements, it is motherhood and apple pie, but we are revisiting it to see if we can't paint a picture in our minds of where we are trying to go and what that means to the customer. When I say we don't have any choice, I don't need to tell anybody around this table how competitive it has become over the last number of years and how much more competitive it is going to get over the next five as companies go global, as the economy in the United States softens up, all sorts of things. If you aren't thinking Lean and driving waste out of your company, you are not going to be there in a year or so. And having customers expect something new and better from you every day just makes us a better company.

BRAD HILLIS **(President, Pride Signs Limited, Cambridge, Ontario. Pride Signs manufactures a full range of illuminated signs):** We formally entered into the Lean initiative about eight months ago and are already seeing fiscal benefits. It covers both the manufacturing environment and the front office. But being more efficient is not really what it means. Lean is about taking the non-value-added items out. You can process small-batch lots very effectively but still not be Lean.

HOGENDOORN: That is where I am struggling with Lean . . . identifying the non-value-added parts. If 12 per cent of my company is research and 13 per cent is engineering, some accountant is going to look at that and say there is no value added from them. What I haven't figured out yet is how to use Lean in these development areas, which do not always have quick, specific and tangible outputs. If a company like mine follows Lean too strictly, I might cut out my R&D, marketing and skunk works because they look like they are not contributing. So I believe when you are doing Lean, you cannot throw the baby out with the bathwater.

ALLEN: I see R&D and marketing as value added in a longer time frame. If you were to apply some Lean techniques, such as a value-stream map, to fundamental building blocks such as R&D and marketing and got everybody in there, you would figure out where the waste was.

HILLIS: Even in the accounting processes, there is a non-value-added test. We are trying to reprogram and think Lean; it is a totally different accounting process. Talk about throughput and profitability and where you add value. You also have to look at the competitive environment, too. If your competitors are more efficient in bringing down their costs, then it is something that you have to consider also. I look at it as an opportunity to pull ahead of your competition.

MODERATOR: When you set out on a Lean path, what is your role?

ALLEN: We brought in a consultant to help us, and this guy looked at me and said, "First of all, it starts with you. You had better be eating change with breakfast, for breakfast." You have to be the motivator and the coach and you have to convince people that there is no turning back.

HILLIS: We had a facilitator come in from BDC [Business Development Bank of Canada]. We have an engineering

manager who has been through Lean initiatives before, and he was part of the transformation, so we have done it through the plant. We are training some Lean leaders on an ongoing basis and are looking at all our processes.

DOUG WHITE **(President, Wellmaster Pipe and Supply, Tillsonburg, Ontario. Wellmaster manufactures a wide range of products, from greenhouse carts to casings for exploration drills):** I think you will find that in all things involving change, you need a champion. My comment is how does Lean affect innovation? One of the things I drive home, specifically on the shop floor, is to constantly think outside the box to come up with more innovative approaches to manufacturing the product and to the product itself. If you are thinking in terms of traditional or hierarchy-type approaches, then you are just doing the same thing over and over. How does Lean get it done faster and with better quality?

NETTLETON: In our experience, the core of Lean is its value-stream mapping. We took things that were 32 steps and now they are six. We also asked ourselves, "How can we do it better so it adds value to the customer?" Those involved in the process feel good because the savings and innovations have come from them, not from me. That is probably as powerful as anything I could dream up.

ALLEN: How do you deal with sales and marketing?

HILLIS: A lot of times, we have to work differently with customers depending on their systems and requirements, and we ask a lot of questions. From a Lean perspective, sales and marketing involves process flow, having the right members of the team in place and a strong leader. Our systems were cumbersome and now they are vastly improved, which allows us to look at value adds, with non-value-added items taken out.

HARVEY SCHILKE **(President and CEO, Protek Systems, London, Ontario. Protek is a value-added business-to-business network systems integrator in the computer market):** In the last few years, we have been going through re-engineering, nothing to do with Lean, but there are similarities. The challenge is that we surveyed some of our 500 customers for feedback on what they need, then tried to paint a vision of our objectives. One of the objectives was "customer for life." Then we went to our staff and said, "What would you change? What would you like to see different?" They came back with 56 good recommendations. But we have had to fight the desire to go back to the old ways. It has been a real change management challenge. I suspect Lean suffers with some of the same challenges.

NETTLETON: We are working very hard to use the pull system, and it has made a huge difference.

STEVENS: Yes, pull is the only way to go.

MODERATOR: How did you get to Lean?

HILLIS: I thought the idea was pretty cool: double your sales with the same number of people and become more profitable through a simplified process. But bringing in Lean is a fairly lengthy process. It is quite an inconvenience. You have to train a series of people, your core people, and then you have to go and train another group and another group. You are constantly doing this. It takes about two years for the process to get consistent results and to become ingrained in your culture.

ALLEN: What we did well in our business for a lot of years was talk about customer satisfaction, on-time delivery, the indices that were important to me. We never really gave the people on the shop floor the tools to say, "Change your world and help me make that better." We tried a couple of times, but we never did that part very well. We never gave them the power to do it. Now I am willing to let them make some mistakes. I don't want to be the obstacle. I now say, "Go for it!"

"Sometimes, you have to admit that the processes and the procedures that you built and held people accountable for aren't appropriate any more. Maybe the waste that you have identified through a value-stream map, which is a Lean technique, tells you that the process that was your baby is actually fat and dumb"

MODERATOR: What are the biggest challenges other CEOs should be aware of?

HILLIS: Lean means changing all the time, accepting change and changing habits. You have to be a good leader and have a Lean champion. It really means getting people to break down what they are currently doing and challenging it, right down to the plant floor. Every time somebody sees something where they can reduce steps, they should be making those changes. Everybody should be thinking about that, in the office, in the accounting department, engineering, etc. Everybody should be involved.

NETTLETON: Cultural change is the biggest single challenge. It is how you deliver your message and how you continually reinforce it. Improvements have to be from the floor, where people are encouraged to bring suggestions forward, are responsible for the improvements and are rewarded for their contributions.

ALLEN: Unless you convince people that this is the way of the future, it is going to die. Your people are going to think, "I don't like change, and now he [Peter] is talking about swimming in it until I retire." You have to be the motivator and the coach and convince people there is no turning back.

MODERATOR: Let's talk about customer value, the essence of the Lean mantra. The idea is that you always have to focus on the customer, that everything you do is measured in terms of value to the customer. How do you make sure that you are giving the customer what he or she wants?

KEITH STEVENS **(Chairman, Execulink Telecom, Burgessville, Ontario. Execulink provides telecommunications solutions as well as Internet, cable and phone services):** We have 50,000 customers. So we have been doing a lot of work on process mapping, trying to figure out how to do things better and not have 10 people touch the thing, have three or five. The challenge is to figure out how a service organization like ours can get rid of waste and benefit from Lean. Customer needs are continually changing. In the service industry, what was good service five years ago is now terrible service. You have to continually upgrade and survey customers. We have to know what they want. You have to make sure that you continue to go back to your customers and ask them how you are doing.

ALLEN: For service firms, Lean is a good set of tools for eliminating waste. For example, you might want to adopt the 5S approach [sort, shine, set in order, standardize and sustain]. If you have a process and think there is waste in it, map it (like Keith is doing), figure out where the waste is. Engage your people. Let them tell you how to make it happen. The brainstorming is good and the future-state mapping is great because everybody can see it will be easier to do it this way.

JIM McCABE **(President, McCabe Promotional Advertising, London, Ontario. McCabe helps companies promote their brands through distribution of promotional products, service and incentive programs and marketing strategies):** The overall intent is to delight the client with each and every order, every time, and in doing that, to make a reasonable contribution to the bottom line. The worst thing that could happen is to deliver something that we think is wonderful but the customer doesn't like; all the work, right through the whole system, becomes waste. There are many ways to prevent this, especially using technology. We provide a lot of virtual samples, and depending upon the size of the order, may actually provide a prototype to ensure a product meets a customer's specifications and expectations. We have also identified the suppliers that we know will perform every time, on time, to meet our customer demands.

MODERATOR: Does the middle manager have a particular role to play in bringing about the Lean transformation?

STEVENS: In my view, if middle management doesn't get it, there is no way you can articulate that throughout the organization. Employees are working with middle management every day. So if middle management is not excited about the process, I suspect it is not going to happen.

HILLIS: Probably one of them [a middle manager] has to be a champion.

MODERATOR: I keep coming across, in my reading, as Brad [Hillis] said, that Lean can reduce waste by 50 per cent and, at the same time, can double sales and double productivity. That sounds astounding.

ALLEN: I just saw our year-end inventory; it was down 25 per cent. It's not because business is slow, but because we have transformed the shop floor from being a consistently muddled stream of interchangeable priorities governed by supervisors to having some discipline, where people say, "You start the order now and you finish it here." That's $250,000 that I am not financing. Now I ask my production people: "I think I am going to sell 35 per cent more next year. Are you guys able to do that?" And they say, "Yes, I can make 1.75 million pieces a week without any more gear." I say, "Are you going to turn on any furnaces?" They say, "No, we are not. We are going to pull faster."

HILLIS: The most amazing Lean transformation came out of looking at our quoting process. We challenged what steps added value to the customer and found a lot of steps that were not necessary and delayed the delivery of the quote. We went from seven days to four days and will end up finally at two days.

ALLEN: In our front-end order-entry process and in shipping, people are saying, "Yes, I think this has to be saving me at least 50 per cent of my time now." Is it working? You bet it is. That starts to impress upon the early adopters. Once you get the early adopters to buy in and proselytize a little bit, the vast majority of people follow. Also, the people who are leading the charge have matured as leaders and what they have done so far is very impressive.

MODERATOR: I am looking at a 2006–2007 survey by CME that talks about the barriers companies face when they are adopting a Lean strategy. Respondents said the top five constraints on continuous improvement, and they are almost all of equal value, are limited resources, cost, lack of qualified personnel, lack of time and organizational culture. We have certainly touched on organizational culture. I am wondering if those who have gone down the Lean road have run into these or other constraints?

ALLEN: I suspect those are the perceived barriers to implementation. I would agree with organizational culture as bona fide. We have to be committed from the top down to change. Another one is: Do I have the knowledge to apply these tools in a business that is transforming? Lack of time is an excuse, not a constraint, because if you are too busy, that is probably because you are busy with the wrong things.

MODERATOR: Are there any closing thoughts or words of advice for other CEOs about Lean? Paul, you said you were skeptical?

HOGENDOORN: Yes, but I have been encouraged. The one question I have always asked in the last 27 years is what makes OES different? "Being different" has built the company. My hesitation with Lean was that if I take my eye off the horizon and concentrate too specifically on one issue or specific area, do we lose focus on profitability and what we are there for? These guys have convinced me that I can take pure Lean – delight your customer and eliminate waste – while continuing to provide what customers want, whether it be the most innovative product, comfortable relationship or best price and quality.

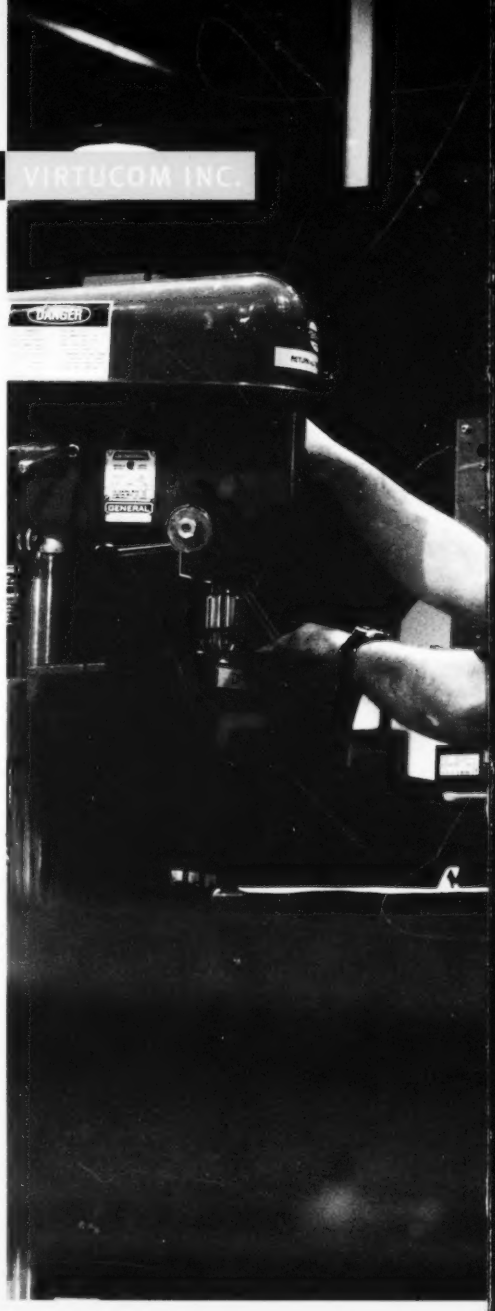
ALLEN: A lot of it is common sense — to get rid of waste and make the customer happy. If I had two banners proclaiming those mantras in front of my staff 10 years ago, I think we would have been clearer in our objectives. Everybody can understand that, no matter where you are in the organization.

NETTLETON: I would say, "Look at Lean so it fits your business and serves you well." Even Toyota looks at us and says, "Yes, you have to adapt it to fit your needs, but the fundamentals are there." I think that is the key.

Empowering teams with Lean

PROFILE VIRTUCOM INC.

The whole team is into Lean at Virtucom, a growing eastern Ontario sheet-metal manufacturer



VIRTUCOM PRESIDENT JAKE MAAT KNEW radical change was required the day he saw the piles of semi-finished components strewn on his shop floor. "It was organized chaos," Maat recalls of the day three years ago when he experienced a corporate epiphany. "I knew there had to be a better way and that if we didn't go Lean, I wouldn't be able to take the business any further."

AT A GLANCE

In business since	2000
Annual sales	$4 million
Number of employees	30
Three-year growth rate (2005–2007)	38%

Today, the Ottawa-area manufacturer of precision sheet-metal components occupies a new facility designed to eliminate waste. Even Maat carries blue boxes of paper recycling outside for pickup and there is not a piece of equipment out of place on the pristine shop floor. Production is organized in cells that work according to just-in-time Lean principles.

Virtucom's two dozen metal fabricators have become Lean practitioners by learning to multitask rather than repetitively performing a single function. Operators, relying on visual cues rather than on a supervisor's instructions, shut down their machines when they see that producing more inventory would simply create a bottleneck. Instead, they walk over to help alleviate the backlog by doing whatever is required.

"Our customers need their orders filled in two to three weeks," says Maat. "Before Lean, it was taking us six to eight weeks. Evidently, they were coming to us only because they had no other option. To be competitive, we had to change our procedures as well as our thought processes."

CHANGE CHAMPION ON BOARD

In 2004, to help transform his company, Maat recruited Allan Maxwell, a British-born production engineer who over the previous four years had introduced Lean methods and thinking to the North American operations of Volex Group, the world's largest independent producer of electronic and fibre-optic cable assemblies. In exchange for an ownership share, Maxwell agreed to move to the much smaller Virtucom and help it realize its ambition of achieving its growth targets by 2013. "Jake needed a Lean champion," says Maxwell, "and I couldn't resist the challenge."

Maxwell has a two-pronged approach to implementing Lean, "a journey from start to no finish." He wants to bring ongoing efficiencies to the plant floor and at the same time make Virtucom employees Lean's biggest promoters.

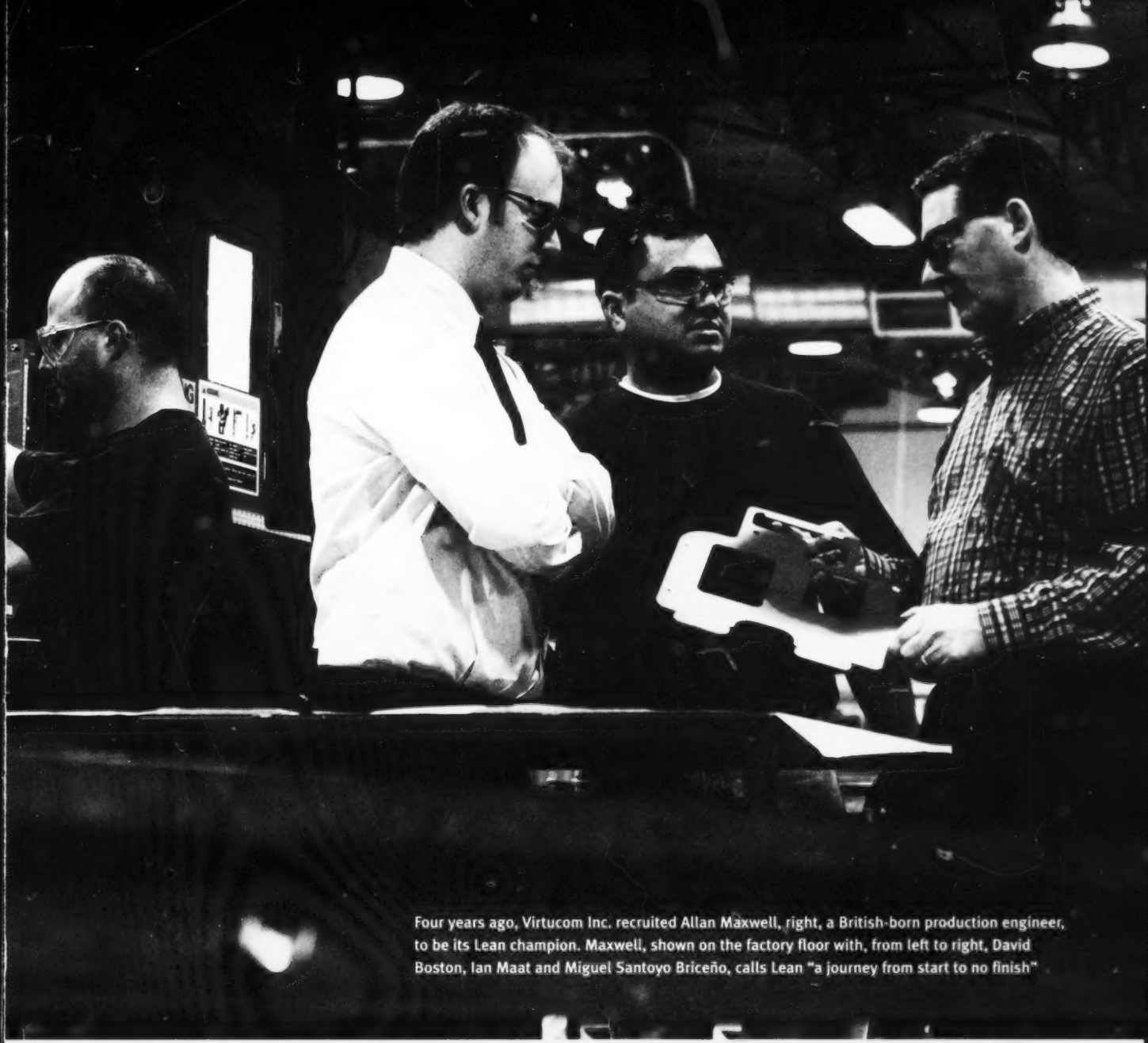
BOOST IN SHIPMENTS

As a first step, Maxwell needed to demonstrate the power of Lean. He changed one part of Virtucom's manufacturing process from the traditional batch system into a Lean, flexible method geared to customer demand. "After two months," he recalls, "people started worrying openly about their jobs. They felt they were not as busy as before since there was no inventory lying around. But, in fact, we were making a record number of shipments."

Virtucom wants to cement employee support by getting them to become part owners. "We want our people to buy into the long-term strategy of tying their future to the company's future," Maxwell says. "But not everyone wants to part with money to buy a company share."

OVERCOMING RESISTANCE

To overcome this resistance, Virtucom has introduced profit sharing based on team performance. Ten per cent of monthly profits are set aside for this purpose. To demonstrate trust, the company provides



Four years ago, Virtucom Inc. recruited Allan Maxwell, right, a British-born production engineer, to be its Lean champion. Maxwell, shown on the factory floor with, from left to right, David Boston, Ian Maat and Miguel Santoyo Briceño, calls Lean "a journey from start to no finish"

monthly profit-and-loss figures to employees on a confidential basis.

Now that the cellular production approach has replaced the traditional assembly line, the next Lean step is to provide employees with more power. Says Maxwell: "We want them to be responsible for productivity, quality control and corrective action, taking ownership for what they manufacture. Once that happens, I'll know we're well on our way."

Still, he says, the cultural "paradigm shift" to achieve that goal may be another three to five years away. Even Maat, at first, had trouble adjusting to Lean principles. "Take a $1-million piece of equipment," he explains. "You want to see it operating 24/7 to amortize its cost. But what if you are just creating inventory that has no market, no customer demand? You have to get used to the machine being idle from time to time and responding to customer pull."

Today, Maat is very comfortable with his company's metamorphosis. In Lean's first year, inventory dropped by 20 per cent and revenues grew by the same amount. Revenues are now increasing by 15 per cent annually, while revenue per employee is up by 60 per cent overall. Clearly, Virtucom is reaping the benefits of thinking Lean.

Four years ago, Virtucom Inc. recruited Allan Maxwell, right, a British-born production engineer, to be its Lean champion. Maxwell, shown on the factory floor with, from left to right, David Boston, Ian Maat and Miguel Santoyo Briceño, calls Lean "a journey from start to no finish"

monthly profit-and-loss figures to employees on a confidential basis.

Now that the cellular production approach has replaced the traditional assembly line, the next Lean step is to provide employees with more power. Says Maxwell: "We want them to be responsible for productivity, quality control and corrective action, taking ownership for what they manufacture. Once that happens, I'll know we're well on our way."

Still, he says, the cultural "paradigm shift" to achieve that goal may be another three to five years away. Even Maat, at first, had trouble adjusting to Lean principles. "Take a $1-million piece of equipment," he explains. "You want to see it operating 24/7 to amortize its cost. But what if you are just creating inventory that has no market, no customer demand? You have to get used to the machine being idle from time to time and responding to customer pull."

Today, Maat is very comfortable with his company's metamorphosis. In Lean's first year, inventory dropped by 20 per cent and revenues grew by the same amount. Revenues are now increasing by 15 per cent annually, while revenue per employee is up by 60 per cent overall. Clearly, Virtucom is reaping the benefits of thinking Lean.

Early results in the Lean journey

One year into its Lean rollout, a Peterborough, Ontario, company is already working more efficiently, reducing waste . . . and saving money

PROFILE

EXECUTIVES AT FISHERCAST GLOBAL Corporation learned the power of Lean in 2002 when a Chinese competitor stole one of the company's key customers. The customer needed a piece of FisherCast machinery and wanted it quickly. FisherCast said that it would try to speed up its normal processes and deliver in 10 weeks rather than its usual 12 to 16 weeks.

AT A GLANCE

In business since	1942
Annual sales	$70 million
Number of employees	290
Three-year growth rate (2005–2007)	19%

"No, thanks," replied the buyer, turning to the Chinese rival who provided the piece in just six weeks. "That was quite a wakeup call," says Bob Espey, the company's executive vice-president, who is leading a Lean culture change at the 66-year-old Peterborough, Ontario, manufacturer of small, die-cast components, most of which are used by the auto industry.

COMPLETELY COMMITTED

Greg Walling, FisherCast's president, believes Lean thinking is the key to success for anyone facing the challenges of low-cost offshore competitors, higher-cost commodities and a stronger Canadian dollar. "We're completely committed to Lean," says Walling.

For his part, Espey says culture change is the biggest obstacle to introducing Lean, "especially at the supervisor level." To engineer FisherCast's cultural revolution, Wayne Wheeler, a former millwright, became the company's project manager for Lean manufacturing and continuous improvement in February 2007.

Wheeler says that while the company is at step 1 of 10 on its Lean journey, major inroads have been made after just one year, even among the supervisors. "Success makes converts and the process starts to build," he says.

Wheeler is not afraid to recommend shutting down a machine if that is what it takes to step back and analyze the existing processes to achieve *kaizen*, or continuous improvement of working practices, in this case bringing about efficiencies through the elimination of waste. "Supervisors are bred to produce more, so they don't like to see their machines idle," he explains. "But one called me recently looking for help and was willing to stop production for a few days in order to solve his problems."

VALUE-STREAM MAPPING

One of Wheeler's biggest successes involved FisherCast's arrangements with an intermediary subcontractor. Both FisherCast and the subcontractor were struggling with delivery and quality issues, along with inventories of close to 150,000 items. As a result, the contract with a major customer was in jeopardy. Managers for FisherCast, the intermediary and the ultimate purchaser met in a hotel for three days, implementing the Lean technique of value-stream mapping in an attempt to identify waste and inefficiencies in their production and delivery processes.

The outcome was that the time between manufacture and delivery dropped from 23 days to eight days and late shipments dropped from 25 per cent to zero.

Major progress was also achieved on the quality side. FisherCast used to spend $200,000 annually under this contract on replacing products that were not up to standard. In the last quarter of 2007, it did not spend a penny.

Wheeler calculates that Lean improvements produced $872,000 in savings last year. In 2008, his target is $1.2 million, not counting "soft savings" from rearranging workflows such as reducing the number of steps in the production process or the number of steps a worker has to walk to replace a part.

UNION PARTICIPATION

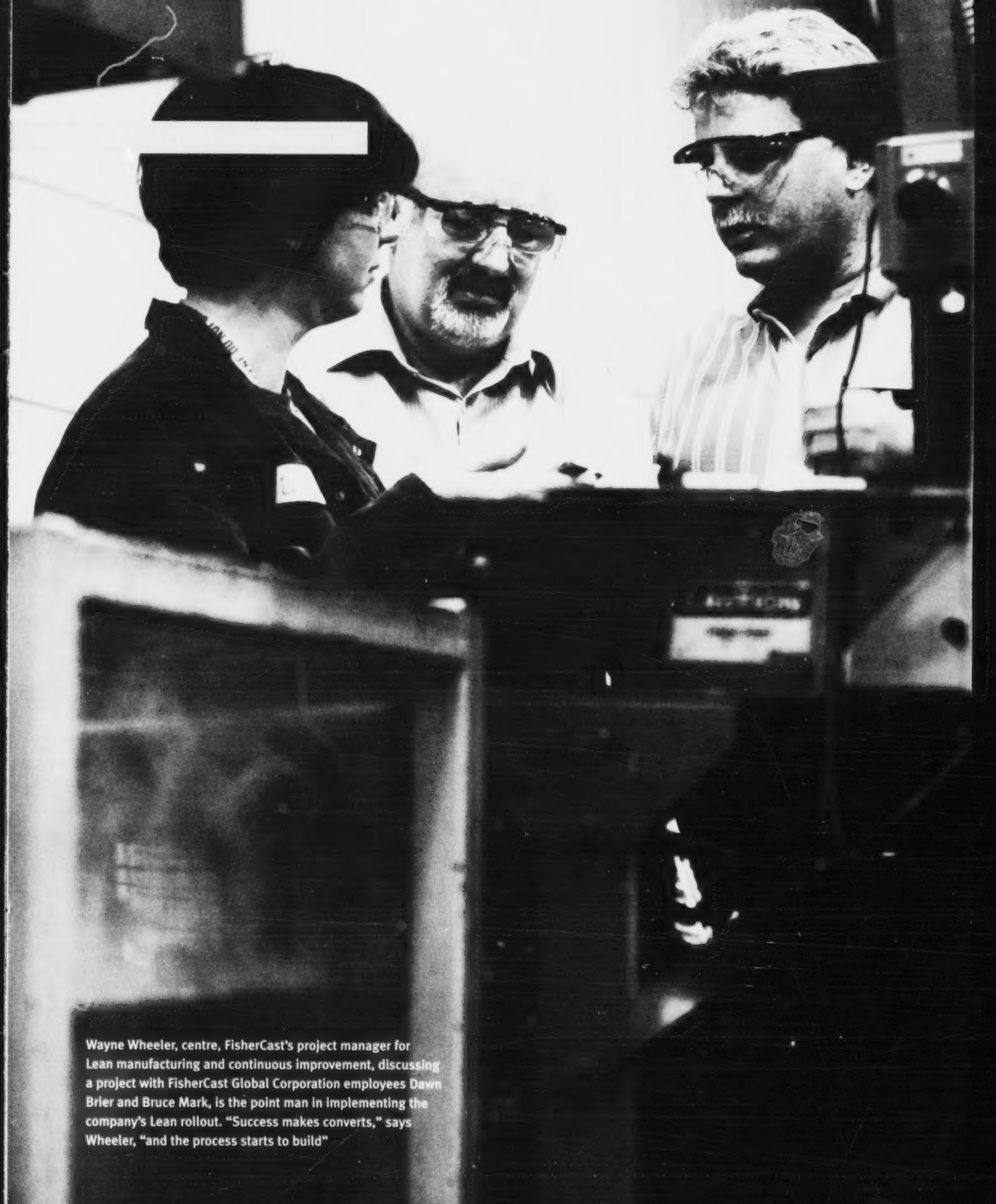
At the outset, the company invited its union to participate in its Lean plan. "Our union understood the need and was very supportive," says Brian Baker, FisherCast's director of strategic planning.

FisherCast, like most Ontario manufacturers, has recently come through some tough years. It consolidated its operations in one facility from two. The move presented a Lean opportunity to rearrange production flows, a work still in progress. "We could never have made the move successfully without input from people on the shop floor on removing waste from our processes," Baker says.

With Lean as an ally, the future looks promising. FisherCast's goal is to go from being a $70-million to a $100-million business in less than five years, driven in large part by its new magnesium die-casting shop. (Magnesium weighs one-quarter as much as zinc, making it appealing to automakers and others who want to achieve weight and energy efficiencies.)

Lean is "just good common sense," explains Walling. "We need better productivity, higher quality and lower costs to compete." So far, so good. Says Walling: "We're now winning work as a result of the savings."

And those products that took up to 16 weeks to deliver now take as little as six, thanks to Lean thinking.

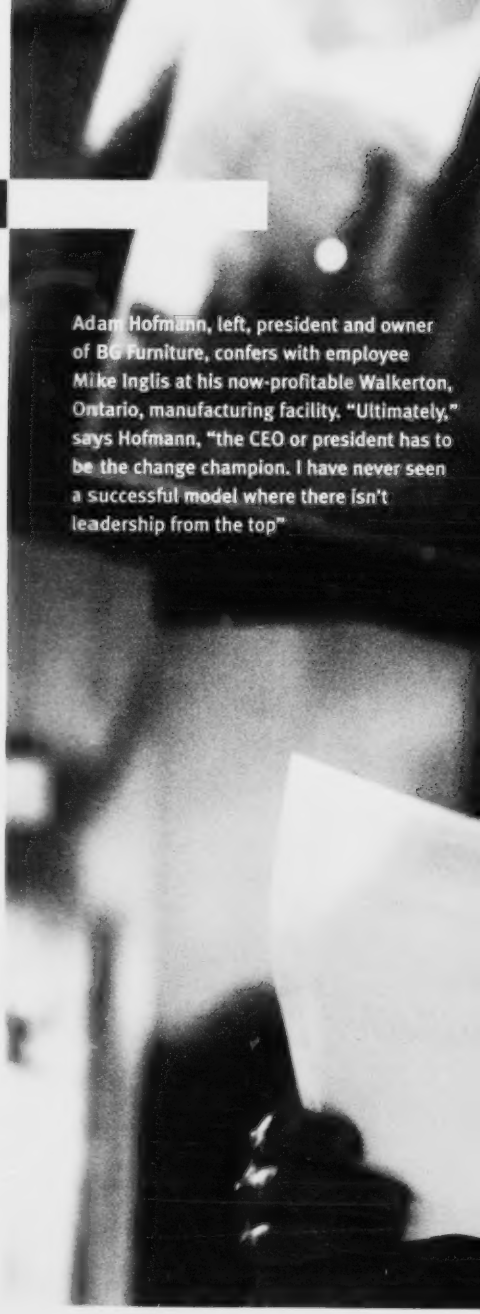


Wayne Wheeler, centre, FisherCast's project manager for Lean manufacturing and continuous improvement, discussing a project with FisherCast Global Corporation employees Dawn Brier and Bruce Mark, is the point man in implementing the company's Lean rollout. "Success makes converts," says Wheeler, "and the process starts to build"

A Lean turnaround

Implementing just-in-time manufacturing and other Lean processes pulls an Ontario furniture maker back from the brink

PROFILE



Adam Hofmann, left, president and owner of BG Furniture, confers with employee Mike Inglis at his now-profitable Walkerton, Ontario, manufacturing facility. "Ultimately," says Hofmann, "the CEO or president has to be the change champion. I have never seen a successful model where there isn't leadership from the top"

During its 80-year history, BG Furniture has weathered the Depression, several major recessions, one world war, the North American Free Trade Agreement (NAFTA) and competition from less-expensive imports. When Adam Hofmann became general manager of the Walkerton, Ontario-based company in 2002, he assessed its survival chances at just 50-50. To resuscitate BG (then known as Bogdon & Gross Furniture Company Ltd.), Hofmann immediately implemented a Lean revolution that has propelled the furniture maker into profitability with a healthy future. In an interview, Hofmann, now BG's owner, explains how he transformed the company.

AT A GLANCE

In business since	1927
Annual sales	$6 million
Number of employees	75
Three-year growth rate (2005–2007)	15%

What was your initial impression?

There was a delivery backlog, but I saw inventory everywhere. The equipment was antiquated and we were facing very high losses. It was very serious.

What was your first step?

First, I created a value-stream map of the current state of the business process and learned that it took about 14 months to convert raw materials into furniture. We could have carried on with our "big batch" approach and made it more efficient, but to become truly competitive, our products needed to be configured to customer specifications.

And then?

We instituted a just-in-time system. We assembled to order instead of on speculation, hoping the product would eventually sell. By identifying waste, we eliminated about 80 per cent of the activity involved in placing an order. Today, we can fill orders in 30 to 45 days. Meanwhile, we developed new product lines and niche markets with our solid hardwood furniture collections. When I came aboard, we had 450 retail customers. Now, we have 40 key dealers and sales have increased by 40 per cent. We are shipping about the same number of pieces, but they are worth 2.5 times more. By taking out waste and rearranging our processes, we are doing more volume in the same space.

Has it been profitable?

We lost money for several years, until 2006, but each year the losses were halved. Last year was profitable, and I expect good profitability in the future. We plan to grow by 15 per cent annually over the next five years and become a $10-million to $13-million company.

How did you measure success?

It is all about the customer. You need performance measures based on customer satisfaction and delivery. Are they buying more? Are they getting it faster? Are there fewer returns and complaints?

Was it a bottom-up process?

We were under immediate pressure from the banks, and I had no choice but to make it a top-down process, which is not ideal. However, there was employee input on a project-by-project basis. Ultimately, the CEO or president has to be the change champion. I have never seen a successful model where there isn't leadership from the top. That person does not have to do all the work, but he or she has to drive the process, establish the road map for change.

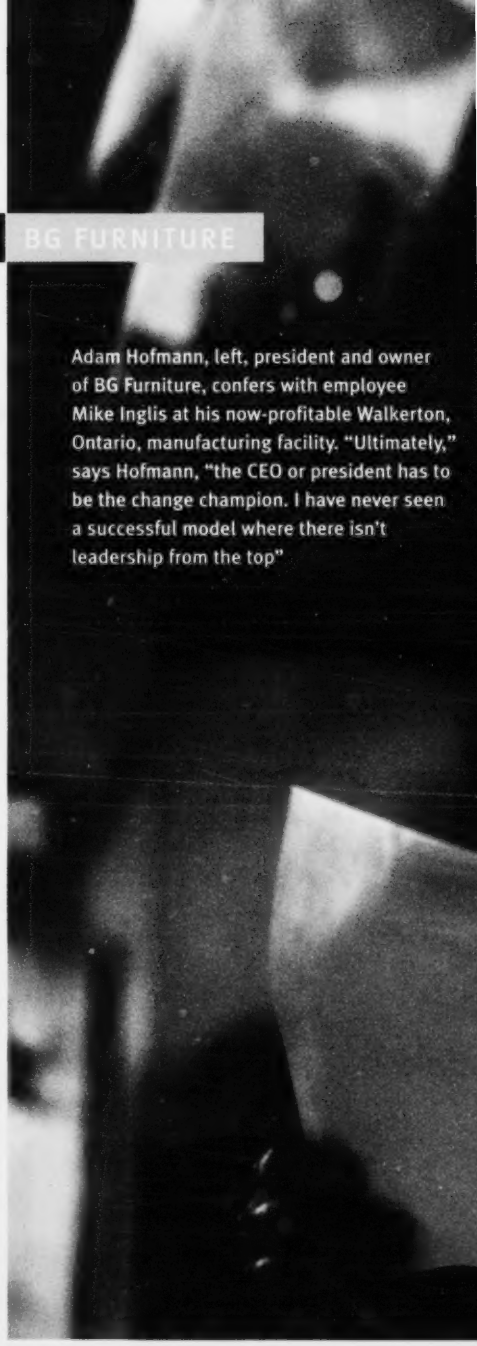
Is it a democratic process now?

Right now, we are at the stage where employees feel that they can bring suggestions to management and let management implement them. We are

A Lean turnaround

Implementing just-in-time manufacturing and other Lean processes pulls an Ontario furniture maker back from the brink

PROFILE BG FURNITURE



Adam Hofmann, left, president and owner of BG Furniture, confers with employee Mike Inglis at his now-profitable Walkerton, Ontario, manufacturing facility. "Ultimately," says Hofmann, "the CEO or president has to be the change champion. I have never seen a successful model where there isn't leadership from the top"

During its 80-year history, BG Furniture has weathered the Depression, several major recessions, one world war, the North American Free Trade Agreement (NAFTA) and competition from less-expensive imports. When Adam Hofmann became general manager of the Walkerton, Ontario-based company in 2002, he assessed its survival chances at just 50-50. To resuscitate BG (then known as Bogdon & Gross Furniture Company Ltd.), Hofmann immediately implemented a Lean revolution that has propelled the furniture maker into profitability with a healthy future. In an interview, Hofmann, now BG's owner, explains how he transformed the company.

AT A GLANCE

In business since	1927
Annual sales	$6 million
Number of employees	75
Three-year growth rate (2005–2007)	15%

Describe the situation when you arrived.
There was a delivery backlog, but I saw inventory everywhere. The equipment was antiquated and we were facing very high losses. It was very serious.

What was your action plan?
First, I created a value-stream map of the current state of the business process and learned that it took about 14 months to convert raw materials into furniture. We could have carried on with our "big-batch" approach and made it more efficient, but to become truly competitive, our products needed to be configured to customer specifications.

What did you do?
We instituted a just-in-time system. We assembled to order instead of on speculation, hoping the product would eventually sell. By identifying waste, we eliminated about 80 per cent of the activity involved in placing an order. Today, we can fill orders in 30 to 45 days. Meanwhile, we developed new product lines and niche markets with our solid hardwood furniture collections. When I came aboard, we had 450 retail customers. Now, we have 40 key dealers and sales have increased by 40 per cent. We are shipping about the same number of pieces, but they are worth 2.5 times more. By taking out waste and rearranging our processes, we are doing more volume in the same space.

What other benefits has Lean brought?
We lost money for several years, until 2006, but each year the losses were halved. Last year was profitable, and I expect good profitability in the future. We plan to grow by 15 per cent annually over the next five years and become a $10-million to $15-million company.

How can you tell whether your Lean initiative is successful?
It is all about the customer. You need performance measures based on customer satisfaction and delivery. Are they buying more? Are they getting it faster? Are there fewer returns and complaints?

What was your role in adopting Lean?
We were under immediate pressure from the banks, and I had no choice but to make it a top-down process, which is not ideal. However, there was employee input on a project-by-project basis. Ultimately, the CEO or president has to be the change champion. I have never seen a successful model where there isn't leadership from the top. That person does not have to do all the work, but he or she has to drive the process, establish the road map for change.

How long do you think full implementation will take?
Right now, we are at the stage where employees feel that they can bring suggestions to management and let management implement them. We are

five years into the process, and it may take another five before employees feel comfortable bringing in an idea to implement themselves.

What are the main obstacles to implementing Lean?

One of the biggest is the banks. When you reduce inventory, they see that as reducing assets and that can make it difficult to borrow money to support growth. Culture change is the other one. People have a natural resistance to change. Middle management has to be on board. If they aren't on the boat, give them the option to leave.

What advice do you have for someone embarking on Lean?

Your first step is not to hire consultants because they will then become the ones leading the process. Consultants and outside expertise can be used after the leaders truly embrace change. First, you need to have the right vision and the right product. Lean won't fix that. It is strictly a tool to integrate into a company's long-term business plan.

Do you have any other advice?

Yes. Don't introduce Lean just to make more money immediately. Short-term projects to increase profits are for bean counters. You should want to develop a distinct advantage to attract customer loyalty that will sustain growth. The profits will come.

Lean, Agile and globally competitive

Ottawa software developer Macadamian Technologies combines Lean and Agile principles to tackle global competition

PROFILE

MACADAMIAN TECHNOLOGIES INC., founded 11 years ago, has never undergone a Lean transformation. That's because the outsourcer of software-product development has been Lean since birth. "Lean is in our DNA," says Frédéric Boulanger, the company's founder and president. "Being flexible so we can respond quickly to customer requirements is part of our formula for success."

AT A GLANCE

In business since	1997
Annual sales	$10.2 million
Number of employees	85
Three-year growth rate (2005–2007)	161%

Despite intense offshore competition, Macadamian's revenue growth has been 161 per cent over the past three years, to $10.2 million. In 2006 and 2007, the Ottawa-based company made *Software Magazine*'s worldwide Top 500 list based on total revenues and in February 2008, *Global Services Magazine* listed Macadamian on its 2008 Global Services 100.

GLOBAL COMPETITION

Macadamian's customers include North American telecommunications giants such as Nortel, governments and the health-care device industry. They typically call upon Macadamian as they attempt to fill a software order when facing a staffing shortage or when lacking a particular expertise.

Macadamian's competition comes from developing nations such as India, Pakistan and China. In response, the company has put in place offshore software engineering teams in Armenia and Romania. It also has an Indian partner.

To compete on quality, Macadamian instills the Lean ethic of continuous improvement into all its staff and processes. "Bad news has to fly as fast as good news," says Sylvain St-Germain, the company's director of process improvement and IT, a friend and classmate of Boulanger's when both studied computer science at the University of Sherbrooke in Quebec. "Bad news becomes good news when it comes with a plan for improvement. Everyone makes mistakes, but I want to make sure that we learn from our mistakes and don't make the same mistake more than once."

"People have to feel they can share their errors," adds Boulanger. "It's not easy to acknowledge mistakes. As CEO, it's my job to set the tone of trust. After all, you learn more from your mistakes than from what you do right. People need the freedom to experiment."

LEAN AND AGILE

Continuous improvement is both a Lean ethic and a Macadamian core value. "For every project, we have a post-mortem where we discuss what went well and, if we screwed up, how," says St-Germain. "In either situation, there are lessons to be learned."

Although Macadamian considers itself a service provider —"We don't have a physical product; our product is service," says St-Germain — it uses the same Lean principles, such as continuous improvement, that apply to manufacturers. As in standard practice on the Toyota assembly line, every Macadamian employee is empowered and expected to point out potential problems at any stage of a job.

In the software development industry, a movement known as Agile software development adheres to a number of principles that are echoed in Lean thinking. Macadamian subscribes to the widely accepted 12-principle Agile Manifesto, which includes: "Continuous attention to technical excellence and good design enhances agility." Explains St-Germain: "When we create software, every developer's work is reviewed for errors. This helps ensure we get rid of the bad code — waste — early in the process, before bugs get entrenched in the system. We have to make sure that our people are working on the most important thing and that it is of value to the customer. We constantly monitor our procedures to ensure there is no waste.

"Simplicity — the art of maximizing the amount of work not done — is essential," adds St-Germain. "Code review can be a lengthy process. We have become smarter in reviewing only that which is necessary."

PREPARED TO RESPOND

Although a software project can be Lean without being Agile or Agile without being Lean, Macadamian is achieving remarkable success by combining the two philosophies.

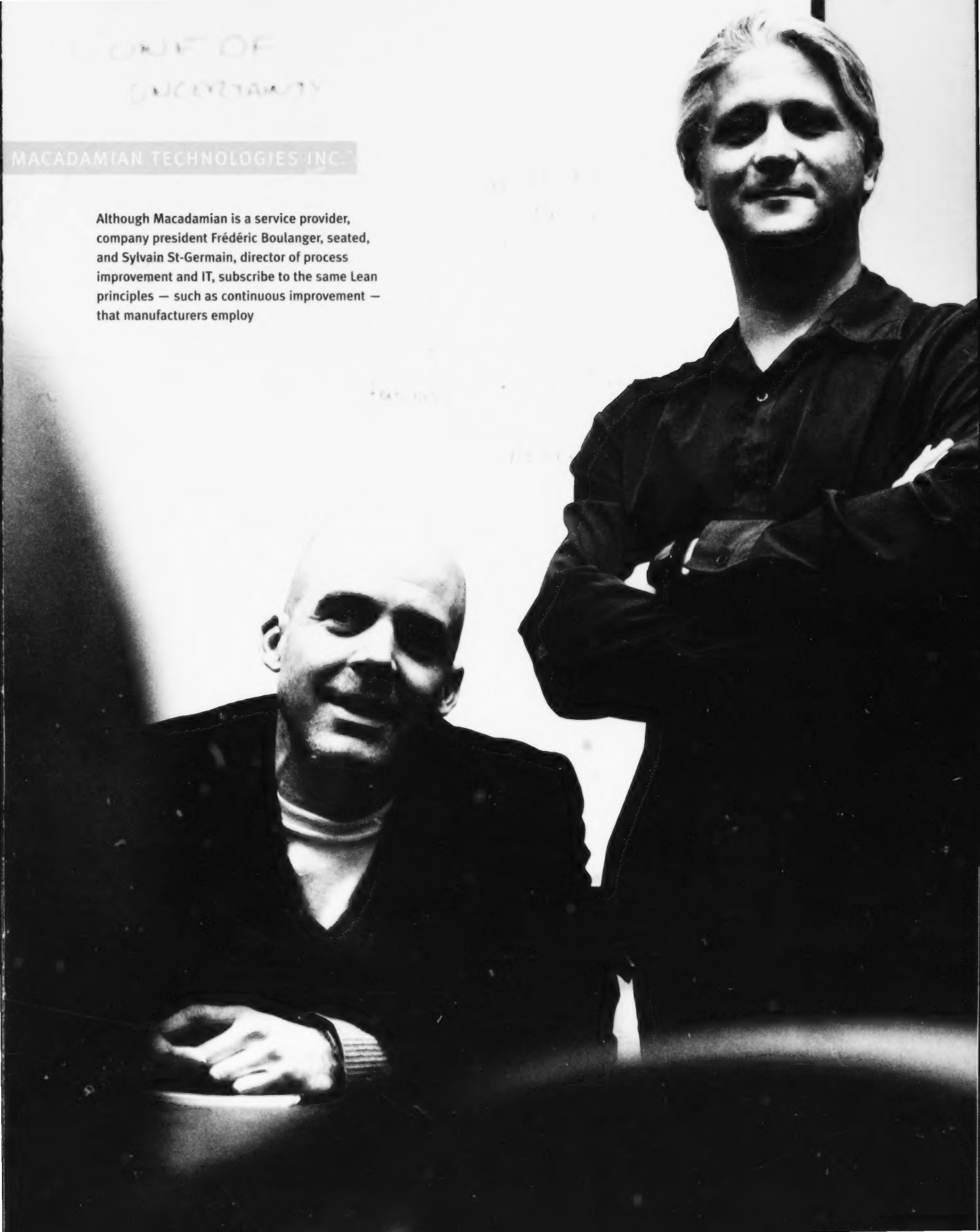
Many CEOs, especially in the service sector, wrongly believe that if their employees are busy all the time, that means there is no waste. "Not so," says Boulanger. "Chaos is a constant in our business. You have to be prepared to respond. If you are stretched to the limit, it will be a disaster."

Looking into the future, Boulanger says he is better prepared to tackle offshore challenges because of his commitment to Lean and his involvement with the Information Technology Association of Canada. "Working on Canada's competitive agenda," he says, "has opened my eyes even more to what is going on elsewhere. In India, where you see a software lab the size of [Toronto's] Pearson airport, you understand very quickly that you are in the manufacturing business."

He adds: "We are up against a work force with different cost structures and an entirely different mindset for work. Obviously, Lean thinking is going to have to have an impact on what we do to compete."

MACADAMIAN TECHNOLOGIES INC.

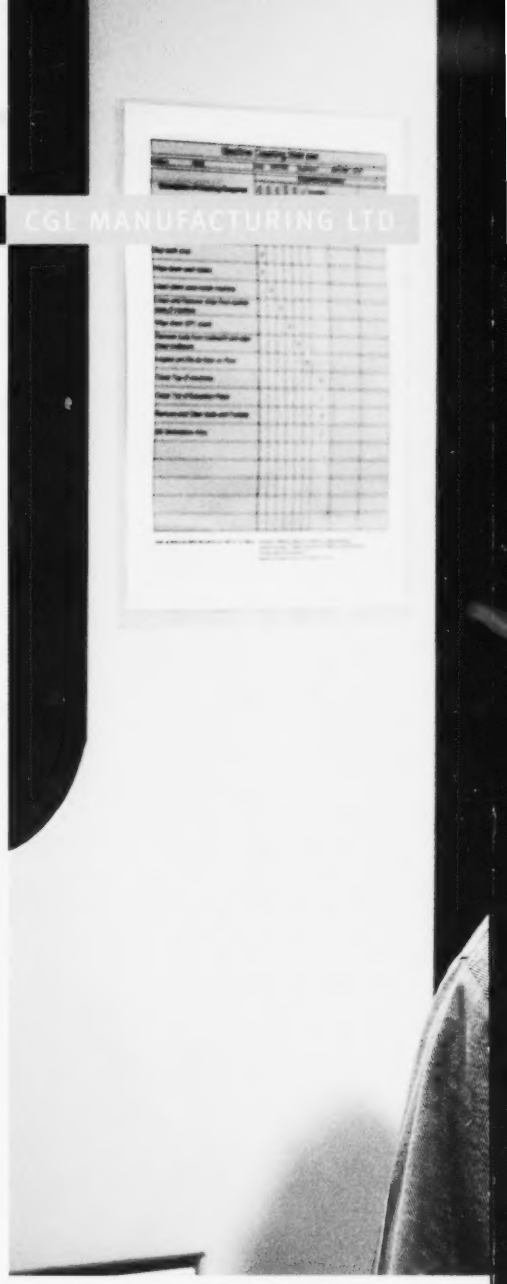
Although Macadamian is a service provider, company president Frédéric Boulanger, seated, and Sylvain St-Germain, director of process improvement and IT, subscribe to the same Lean principles — such as continuous improvement — that manufacturers employ



"Continuously going Lean"

PROFILE CGL MANUFACTURING LTD

A customer's demand for more competitive pricing prompted David Deskur to adopt Lean at CGL Manufacturing and to maintain the momentum



VISITORS TO CGL MANUFACTURING LTD.'S head office in Guelph, Ontario, encounter the company's ethos as soon as they enter the front door. A number of eye-catching but simply designed framed messages hang on the corridor wall leading into the plant and offices. "Introduction to Lean Thinking" is the title of the first, "Plant Layout for Continuous Flow" is another, and so on down the row. The message is clear: you have entered an operation that is proud to declare, "Lean is king."

AT A GLANCE

In business since	1977
Annual sales	$35 million
Number of employees	170
Three-year growth rate (2005–2007)	74%

There is something more going on at CGL than simply proclaiming pride in the Lean strategies that have produced success. "Communication is key to changing a culture and anything, like these plaques, that reminds people of our ongoing goals is a good thing," says David Deskur, CGL president and part owner.

"Lean is relatively simple," Deskur adds. "It has common-sense tools and principles that are easy to understand. The challenge, however, and it never goes away, is the cultural aspect of how to get people enthusiastic about a new way of doing things."

CGL is in the business of providing a range of machining, welding, fabrication, painting and assembly services for the off-road heavy-equipment industry, especially the construction, forestry and locomotive sectors. Among its customers are Volvo Group, General Electric, The Raymond Corporation, John Deere Ltd., Tigercat and Komatsu.

A KEY LEAN PRINCIPLE

Deskur, a skilled welder and machinist, joined CGL in 1979, two years after it started. At the time, it was a "small-job shop with just five guys who did everything needed to make it happen." That is when he first appreciated the power of flexibility in both work processes and employee skills, a key Lean principle.

Deskur also quickly learned another Lean lesson. Since CGL manufactures products to a customer's specifications, "to grow the business, you have to give the customer what is needed, when it is needed and at a competitive price."

Indeed, the need to deliver products at a competitive price triggered CGL's formal adoption of Lean. In Deskur's first decade with the company, it became a $10-million business, mostly through the growth of one customer, The Raymond Corporation, a lift-truck manufacturer. Then came another decade of expansion, this time fueled by a few more customers. In 2000, however, CGL "hit a wall."

One major customer, which represented a quarter of CGL's business, demanded a 20 per cent price reduction. "The margin was not there," recalls Deskur. As a result, dramatic changes were required.

About the same time, lured by a flyer promising to "cut waste, reduce costs and improve profits," he attended Canada's first annual forum on Lean manufacturing. "It opened my eyes," says Deskur, who by that time had become part owner of CGL.

THREE-YEAR LEAN VISION

Inspired by the forum, Deskur returned to Guelph and instituted a three-year Lean-enterprise vision. Identifying and eliminating waste was job number one. "In manufacturing, there is a tendency to think that the customer is willing to pay for everything we do in the shop," he says. "You can't see the waste."

Once the Lean initiative got rolling, though, waste wasn't hard to find. By moving from the traditional "batch-and-queue" system, which often produced

"Lean," says David Deskur, president and part owner of CGL Manufacturing, "is relatively simple. It has common-sense rules and principles that are easy to understand. The challenge is getting people enthusiastic about a new way of doing things"

unwanted, wasteful inventory, to an integrated "cellular" model, where complete jobs were performed by teams, improvements were immediately apparent. In the first year, the distance travelled by forklifts on the plant floor dropped by 1,000 kilometres.

Other improvements over the three years include the following: revenues increased by 50 per cent, inventory decreased by 30 per cent, lead times were reduced by at least 20 per cent and the time between a customer placing an order and the order reaching the floor dropped by nearly 40 per cent. The resulting savings allowed CGL to achieve the customer's 20 per cent price reduction demand and still turn a profit.

Today, CGL is well recognized in the Lean manufacturing community and often hosts benchmarking tours for other companies. It has an employee performance-management system that rewards Lean behaviours such as involvement in continuous performance improvement projects, understanding value-stream mapping and working in teams. The company boasts sales of $35 million and has 170 full-time employees on three shifts. The goal is to be a $50-million company in five years, despite the challenges posed by Asian competitors, a higher Canadian dollar and rising energy costs. Deskur is confident he can reach his objectives by maintaining Lean principles in ongoing waste-reduction and customer-service improvements.

CGL takes its name from its three founders: Charlie, George and Les. They are no longer in the picture. Today, says Deskur, CGL means "continuously going Lean." ●

Lean and green

An innovative Toronto label manufacturer demonstrates that Lean goes together naturally with a commitment to the environment

PROFILE

METRO LABEL GROUP INC., CANADA'S leading global-reaching manufacturer and marketer of pressure-sensitive labels, practised Lean thinking long before the term became popular, but only recently has the company embarked on a formalized approach of integrating Lean throughout its award-winning operations. "Thinking Lean means thinking about how we can do what we do with less: less time, less staff and less materials," says Sandeep Lal, president of the family firm his immigrant father established in 1974.

AT A GLANCE

In business since	1974
Annual sales	$60 million
Number of employees	275
Three-year growth rate (2005–2007)	40%

At its head office in northeast Toronto, Metro Label has been making its pressure-sensitive, as opposed to lick-on, labels on a just-in-time basis from the get-go. "We always believed we could better serve our customers without a large inventory," says Lal. "If I put $1 million into inventory, my equipment is not free for other customers who need a rush order. With low inventory and just-in-time delivery, we save space and handling time and can redeploy our capital to grow the business."

STAYING AHEAD OF THE CURVE

Metro Label was also fighting Lean's war on waste long before others took up that battle. "We came to Lean organically," says Lal. "Our pressure to continuously reduce costs is internal, not from competitors or customers. We have to do something to stay ahead of the curve."

Being one of the first label manufacturers to introduce a computerized defect-detection system in 2006 put Metro Label ahead of the competition. In another instance, it faced a profit challenge making so-called low value-added labels for items such as supermarket meat packages. The company's solution was to modify the existing technology for another line of labels. The outcome was that wasteful downtime was cut in half and all waste products, as well as Metro Label's two main competitors in this sphere, were eliminated. These labels now contribute to the bottom line.

Indeed, Metro Label's revenue growth over the past three years is a robust 40 per cent. The company is a $60-million business, with 275 employees. It operates manufacturing facilities in Toronto (Ontario), Vancouver (British Columbia), Montreal (Quebec) and Napa Valley (California), an operation that is appropriately dedicated to making wine-bottle labels. Other labels are found on a wide range of household products, from window cleaners to cosmetics.

THE SIX SIGMA APPROACH

In part to maintain future growth, in November 2007, Metro Label hired Lean champion Glenn Roberts, a Six Sigma "green belt." Roberts, now plant manager, earned his green belt after intensive study that qualifies him to lead sophisticated, data-driven Six Sigma improvement projects. First developed by Motorola, Six Sigma strives to improve quality by eliminating defects. It shares several principles with Lean, including continuous improvement.

Roberts wants to infuse all employees with his and Lal's enthusiasm for Lean thinking. "People like the machine operators need to buy into the program and participate, rather than me preaching," he says. "But once people have a few tools, the light goes on."

WASTE-REDUCING FIXES

As a first step, Roberts is focusing on "low-hanging fruit," the easy fixes to reducing waste. "We used to shut down all machines at lunch," he says. "But now we keep some lines going to ensure there are no late deliveries. Those operators split their lunch."

Such smart thinking, innovation and continued growth have put Metro Label in rare corporate company. In 2007, for the third year in a row, it made the 50 Best Managed Companies list, a competition sponsored by Deloitte, CIBC Commercial Banking, the *National Post* and Queen's School of Business.

Metro Label is also winning awards in another field. Its new 18,880-square-metre Toronto facility opened in 2005 and in May 2006, it became one of the first LEED (Leadership in Energy and Environmental Design) certified manufacturing facilities in Canada. This esteemed green-building designation reflects Lal's personal and business commitment to the environment. "We firmly believe that corporate environmental responsibility makes good business sense," he says.

Heat recovery units that reuse the heat from the printing presses to warm the building in the winter and reclaimed rainwater to flush toilets, among other measures, have produced a 28 per cent saving in energy costs. For Metro Label, these energy-saving measures are yet another profitable way of reducing waste. ■

Metro Label president Sandeep Lal, right, hired Glenn Roberts, left, to spearhead the company's recently formalized Lean program. "We came to Lean organically," says Lal. "Our pressure to continuously reduce costs is internal, not from competitors or customers"

Lean perspectives

"Haste makes waste."

BENJAMIN FRANKLIN

"It doesn't matter what commodity you produce or what size you are, you will prosper from adopting Lean. The principles are the same for everyone."

MIKE SINNAEVE, *North American Vice-President for Operational Improvement and Quality, Magna International Inc.*

"Lean is about taking the non-value-added items out."

BRAD HILLIS, *President, Pride Signs Limited*

"In our experience, the core of Lean is its value-stream mapping. We took things that were 32 steps and now they are six. Those involved in the process feel good because the savings and innovation have come from them. That is probably as powerful as anything I could dream up."

C. J. DAVID NETTLETON, *President, Sertapak Group Packaging Systems*

"Lean thinking is lean because it provides a way to do more with less and less — less human effort, less equipment, less time and less space — while coming closer to providing customers with exactly what they want."

JAMES P. WOMACK, *author and Lean expert*

"Success makes converts and the process starts to build."

WAYNE WHEELER, *Project Manager, Lean Manufacturing and Continuous Improvement, FisherCast Global Corporation*

"A lot of it is common sense — to get rid of waste and make the customer happy. If I had two banners proclaiming those mantras in front of my staff 10 years ago, I think we would have been clearer in our objectives. Everyone can understand that, no matter where you are in the organization."

PETER ALLEN, *President, Electrical Contacts Ltd.*

"Continuous improvement, or *kaizen,* is critical. It's about culture change, rather than a suggestion box."

ADAM HOFMANN, *President and Owner, BG Furniture*

"Though the service sector has been slow to adopt Lean, the principles of identifying value to the customer, simplifying flow to minimize waste and pulling demand for greater profitability apply to all types of business environments."

BETSI HARRIS EHRLICH, *author and industrial engineer*

"The best award for Lean is being profitable."

SANDEEP LAL, *President, Metro Label Group Inc., a multiple winner of both environmental and business awards*

Acknowledgements

The Ministry of Small Business and Entrepreneurship extends its appreciation to the CEOs and presidents of successful small and medium-sized enterprises (SMEs) across Ontario, Lean champions, topic experts and commentary contributors who generously shared their time, experiences and perspectives for this report.

CEO PROFILES

Frédéric Boulanger
President and Founder
Macadamian Technologies Inc.
Ottawa
www.macadamian.com

David Deskur
President
CGL Manufacturing Ltd.
Guelph
www.cglmfg.com

Adam Hofmann
President and Owner
BG Furniture
Walkerton
www.bogdonandgross.com

Sandeep Lal
President
Metro Label Group Inc.
Toronto (Head Office), Montreal, Vancouver, Napa Valley
www.metrolabel.com

Jake Maat
President
Virtucom Inc.
Ottawa
www.virtucom-inc.com

Greg Walling
President
FisherCast Global Corporation
Peterborough
www.fishercast.com

TOPIC EXPERTS

Dave Hogg, P. Eng.
Director
High Performance Solutions Inc.
Kitchener
www.hpmconsortium.com

Theo Peridis
Professor of Strategic Management and International Business
Schulich School of Business
York University
www.schulich.yorku.ca

CEO ROUND TABLE

Peter Allen
President
Electrical Contacts Ltd.
Hanover
www.e-c-l.com

Brad Hillis
President
Pride Signs Limited
Cambridge
www.pridesigns.com

Paul Hogendoorn
President
OES Inc.
London
www.oes-inc.com

Jim McCabe
President
McCabe Promotional Advertising
London
www.mccabepromo.com

C. J. David Nettleton
President & CEO
Sertapak Group Packaging Systems
Woodstock
www.sertapak.com

Harvey Schilke
President and CEO
Protek Integrated Business Systems
London
www.proteksystems.com

Keith Stevens
Chairman
Execulink Telecom
Burgessville
www.execulink.com

Douglas White
President
Wellmaster Pipe and Supply
Tillsonburg
www.wellmaster.ca

LEAN CHAMPIONS

Brian Baker
Director of Strategic Planning

Bob Espey
Executive Vice-President

Wayne Wheeler
Project Manager, Lean Manufacturing and Continuous Improvement
FisherCast Global Corporation
Peterborough
www.fishercast.com

Allan Maxwell
General Manager
Virtucom Inc.
Ottawa
www.virtucom-inc.com

Glenn Roberts
Plant Manager
Metro Label Group Inc.
Toronto
www.metrolabel.com

Sylvain St-Germain
Director of Process Improvement & IT
Macadamian Technologies Inc.
Ottawa
www.macadamian.com

CORPORATE COMMENTARY

Ed Enns
North American Director of Purchasing
Magna International Inc.
Toronto
www.magna.com

Linda Hasenfratz
CEO
Linamar Corporation
Guelph
www.linamar.com

Mike Sinnaeve
North American Vice-President for Operational Improvement and Quality
Magna International Inc.
Toronto
www.magna.com

STATISTICS

Canadian Manufacturers & Exporters (CME)

Selected resources

Reading and references, organizations and advisory services

READING AND REFERENCE

Lean Solutions: How Companies and Customers Can Create Value and Wealth Together, James P. Womack and Daniel T. Jones, Free Press, 2005.

Lean Thinking: Banish Waste and Create Wealth in Your Corporation, James P. Womack and Daniel T. Jones, Simon & Schuster, 1996.

Service with a Smile: Lean Solutions Extend beyond the Factory Floor, Betsi Harris Ehrlich, *Industrial Engineer,* Volume 38, Issue 8, August 2006.

Transactional Six Sigma and Lean Servicing™: Leveraging Manufacturing Concepts to Achieve World-Class Service, Betsi Harris Ehrlich, CRC Press LLC, 2002.

The Lean Enterprise Memory Jogger™: Create Value and Eliminate Waste throughout Your Company, Richard L. MacInnes, GOAL/QPC, 2002.

Target, a magazine for senior and experienced manufacturing professionals who are continuously reinventing products and services to meet tough competitive challenges, published by the Association for Manufacturing Excellence (AME).
www.ame.org

20/20, Canada's industry association magazine, published six times a year by Canadian Manufacturers & Exporters (CME).
www.manufacturingourfuture.ca

PLANT, Canada's Industry Newspaper, founded in 1941, published 12 times a year by Rogers Publishing Ltd.
www.rogerspublishing.ca

ORGANIZATIONS

Association for Manufacturing Excellence (AME)
A not-for-profit organization dedicated to helping companies with continuous improvement and their pursuit of excellence. Whether you are looking to learn about Lean manufacturing or one of the continuous improvement tools such as value-stream mapping, *kaizen,* Lean supply chain, Lean new product development, Lean accounting or leadership of Lean transformation, AME offers practitioner-based and hands-on events and workshops.
www.ame.org

Canadian Manufacturers & Exporters (CME)
Canada's largest trade and industry association, CME promotes the continuous improvement and competitiveness of Canadian manufacturing and exporting through engagement of government at all levels. Its membership is drawn from all sectors of Canada's manufacturing and exporting community and from every province across the country. The association represents Canada's leading global enterprises and more than 85 per cent of CME's members are small and medium-sized enterprises.
www.cme-mec.ca

High Performance Manufacturing Consortium (HPMC)
Incorporated in the Province of Ontario as a non-profit corporation, HPMC exists to assist its members to individually and collectively become successful global competitors. HPMC develops and delivers member-defined practical programs and facilitates exchanges and new approaches to improve manufacturing performance, such as the introduction of Lean accounting, Lean Sigma, on-site facilitation of the 5S approach, value-stream mapping, continuous improvement and direct coaching.
www.hpmconsortium.com

Information Technology Association of Canada (ITAC)
The voice of the Canadian information and communications technologies (ICT) industry in all sectors, ITAC identifies and leads on issues that affect the ICT industry and advocates initiatives that will enable its development. Working from offices in Toronto, Ottawa, Edmonton and Montreal, ITAC promotes a business climate conducive to growth through policy and advocacy, member business development, networking and information exchange programs. Members also benefit from ITAC's international alliances.
www.itac.ca

Lean Enterprise Institute
A non-profit education and research organization founded in 1997 by James P. Womack to promote and advance the principles of Lean thinking in every aspect of business and across a wide range of industries. Its global mission is to be the leading educator for society in maximizing value and eliminating waste.
www.lean.org

Society of Manufacturing Engineers (SME)
The world's leading professional society advancing manufacturing knowledge and influencing more than half a million manufacturing practitioners annually, SME promotes an increased awareness of manufacturing engineering and keeps manufacturing professionals up-to-date on leading trends and technologies. SME has members in more than 70 countries, including 12 Ontario chapters, and represents manufacturing practitioners across all industries.
www.sme.org

ADVISORY SERVICES

Ontario Ministry of Small Business and Entrepreneurship (MSBE) has a network of business advisors in 12 offices across the province to help growth-oriented small and medium-sized enterprises plan for growth and achieve their business goals by supporting the development of new products, services and markets; connecting businesses to ministry and government programs and resources (e.g., Wisdom Exchange, Energy and Lean workshops and Oil Sands opportunities); facilitating business-to-business networking and linkages; providing advice on accessing financing to support growth initiatives.
www.sbe.gov.on.ca

Bracebridge
Tel: 705-646-5548
Fax: 705-645-8372

Toronto
Tel: 416-235-4278
Fax: 416-235-4338

Hamilton
Tel: 905-521-7221
Fax: 905-521-7398

Kingston
Tel: 613-531-5594
Fax: 613-531-5598

Kitchener
Tel: 519-744-6391
Fax: 519-571-6104

London
Tel: 519-873-4480
Fax: 519-873-4488

Midhurst
Tel: 705-739-5860
Fax: 705-739-8901

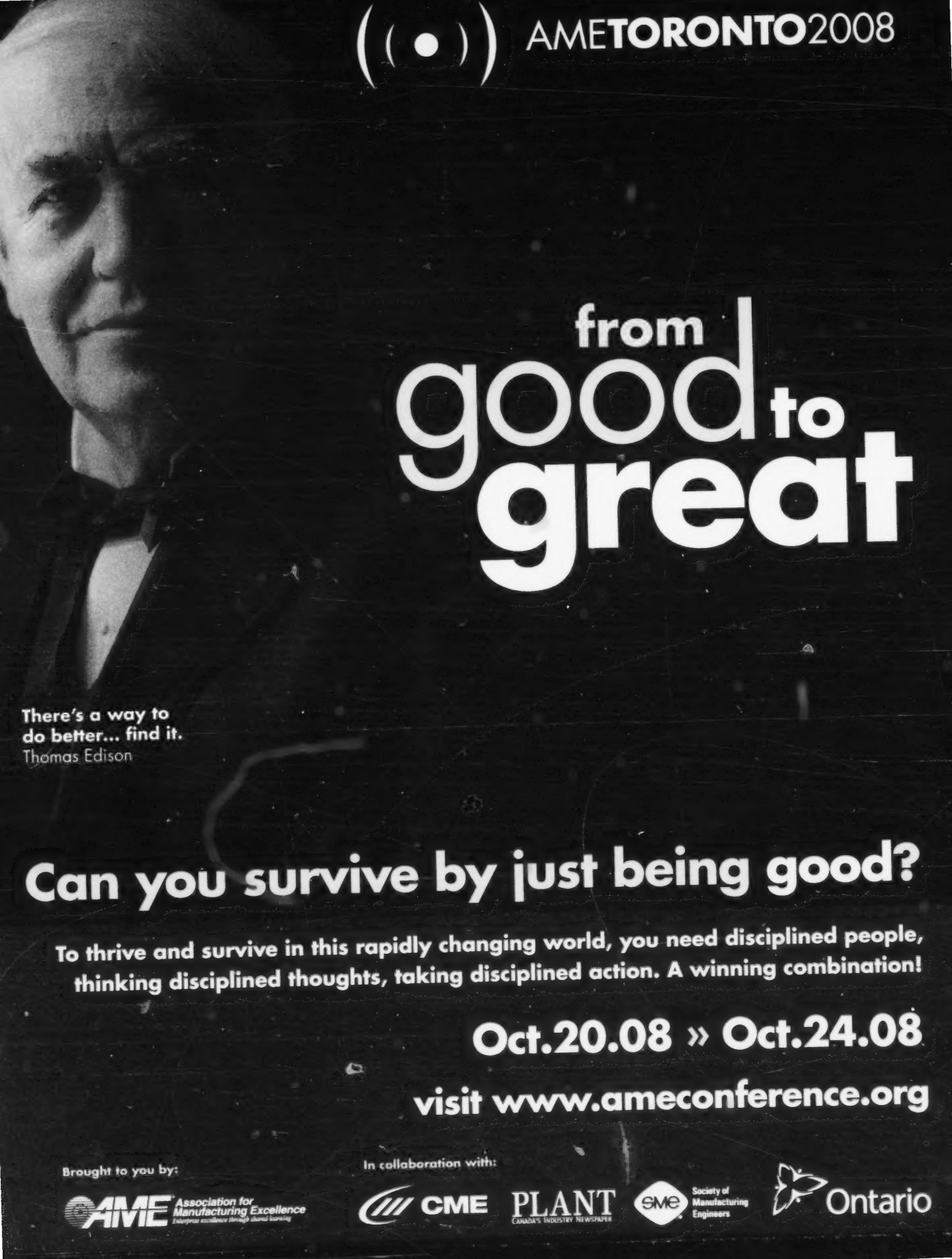
Ottawa
Tel: 613-241-3841
Fax: 613-241-2545

Peterborough
Tel: 705-755-5984
Fax: 705-755-2631

St. Catharines
Tel: 905-704-3941
Fax: 905-704-3955

Whitby
Tel: 905-665-4040
Fax: 905-665-4042

Windsor
Tel: 519-252-1704
Fax: 519-252-3476


AMETORONTO2008
from
good to
great
There's a way to
do better... find it.
Thomas Edison
Can you survive by just being good?
To thrive and survive in this rapidly changing world, you need disciplined people, thinking disciplined thoughts, taking disciplined action. A winning combination!
Oct.20.08 » Oct.24.08
visit www.ameconference.org
Brought to you by:
AME Association for Manufacturing Excellence
In collaboration with:
CME
PLANT
CANADA'S INDUSTRY NEWSPAPER
SME Society of Manufacturing Engineers
Ontario

Leading Growth Firm Series

CEO PERSPECTIVES

The Leading Growth Firm Series researches and promotes the effective management practices of CEOs of Ontario's innovative, high performance firms.

16 Thinking Lean
15 The Mentoring Advantage
14 Shifting Demographics: The Search for Talent
13 Outsourcing: Alliances for Growth
12 Why Leading Growth Firms Matter
11 Planning for Succession
10 Partnering for Growth
9 High Performing Advisory Boards
8 Winning Management Teams
7 Leveraging Customer Relationships to Drive Growth
6 Dynamics of Growth: Is High Growth Sustainable?
5 The Wisdom Exchange 2000 Report
4 The E-Business Readiness Assessment Report
3 The Six Stages of Growth
2 The Growth Builders Report
1 The Innovation Report

To comment on this report or others in the series,
E-mail **ann.matyas@ontario.ca**

Ministry of Small Business and Entrepreneurship
Business Advisory Services Branch
Partnership and Business Development
56 Wellesley Street West, 4th Floor
Toronto, ON M7A 2E7
www.sbe.gov.on.ca

Queen's Printer for Ontario 2008
ISBN 978-1-4249-6577-9